# SUPPLEMENT.


# The Mining Journal,

## RAILWAY AND COMMERCIAL GAZETTE:

**FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.**

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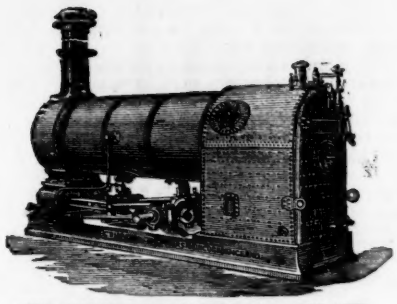

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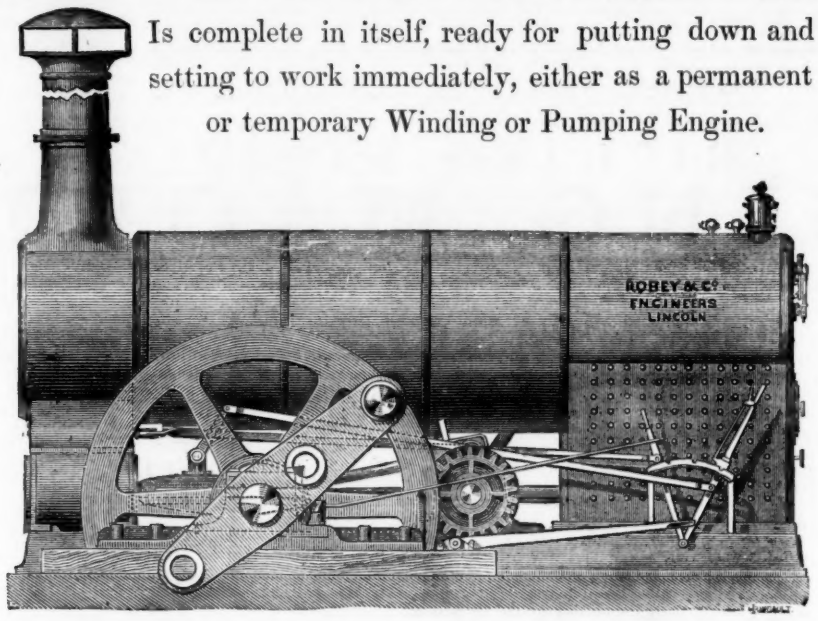


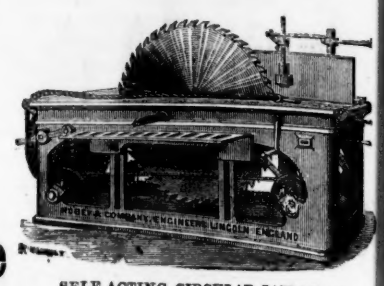


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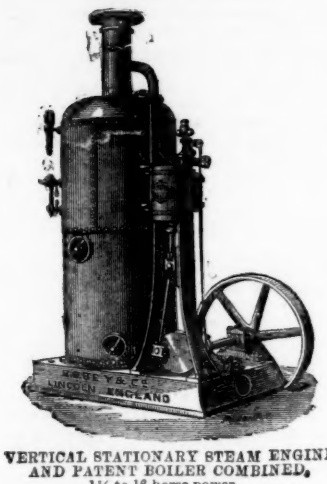


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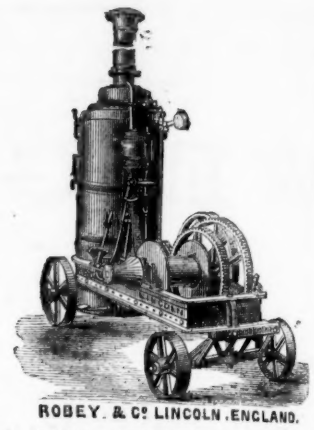


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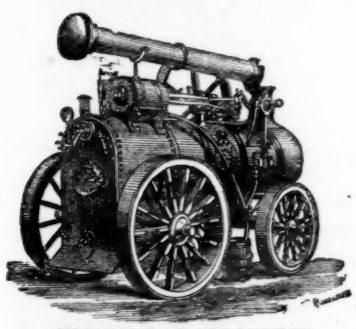

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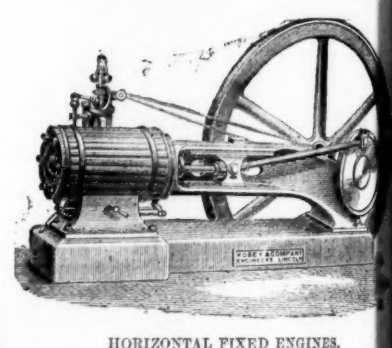

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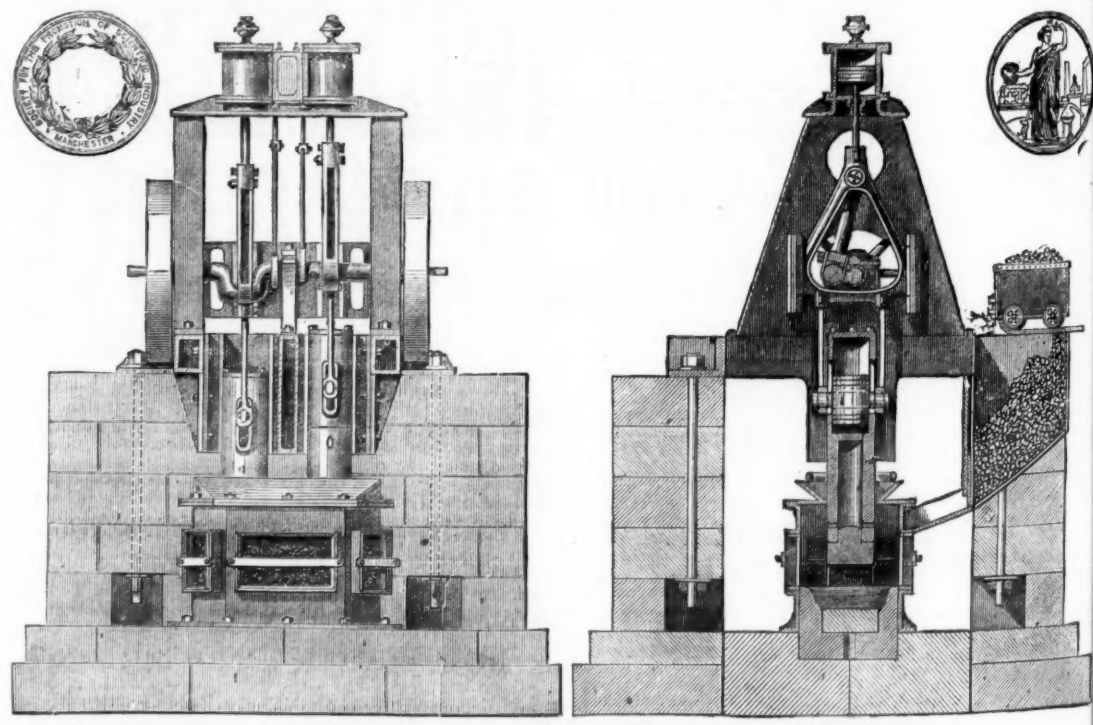

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## TANKERVILLE GREAT CONSOLS COMPANY (LIMITED).

In another column will be found the prospectus of the Tankerville Great Consols Company (Limited). The three properties which this company has started to work under one management are so large and important, and the welfare of the district in Shropshire in which the setts are situated is so intimately bound up with, and it may be said dependent upon, the success of this gigantic undertaking, that the prospectus demands something more than the brief notice which is customarily devoted to calling attention to the inauguration or resuscitation of industrial enterprises.

The events which led to the formation of the Tankerville Great Consols Company are shortly these. The three large and valuable mines which, in future, will be worked by the new company—the Tankerville, Bog, and Pennerley—are located close to and, in fact, adjoin each other. Some time since the workings at Bog and Pennerley were suspended for want of a small additional amount of funds, and not from any falling off in the quantity or quality of the ore. The Tankerville, notwithstanding the severe and almost unparalleled depression of the times, managed to keep on, but the action of the management was greatly circumscribed, and their efforts to obtain successful results very seriously hampered and impeded, owing to the same cause which had necessitated the temporary cessation of operations at the two sister mines. In the meantime the liquidation of the Bog and Pennerley proceeded in the usual course, and eventually both properties were ordered to be sold by order of the Court. At this juncture Mr. PETER WATSON (who has an intimate knowledge of the mining capabilities of the district, and has taken a deep and successful interest in their development) came forward and bought both properties after negociations for purchase, which had extended over nearly two years. The intention of Mr. Peter Watson at the time he purchased Bog and Pennerley was to work them as one united undertaking. About the time of the completion of the purchase of Bog and Pennerley by Mr. Watson, the Tankerville had become somewhat more curtailed in its pecuniary resources, and had in fact, arrived at a condition that it became a question with the management as to how long operations could be kept on; or perhaps it would be more correct to say that there was really not much question about it, inasmuch as the sinews of war had run so short that it became evident prompt measures must be taken to find the wherewithal to keep the works going so as to vigorously open out the ore ground. This was the state of things which the Tankerville shareholders had to face, and it is right to say that they appreciated the difficulty of the position, and met it by probably the only measures which could have extricated them from the somewhat embarrassed circumstances in which they were placed. They met in ordinary general meeting on the mine on Aug. 31 last, when Mr. Peter Watson, the Chairman, explained fully and clearly the precise position of affairs. Various ways out of the difficulty were suggested by different speakers, but the plan which recommended itself to the almost unanimous approval and acceptance of the shareholders was that the Bog and Pennerley should be amalgamated with the Tankerville, and worked as a united undertaking under one board of management. To this proposal Mr. Peter Watson assented, on terms which were stated to the meeting, and which certainly may be regarded as extremely moderate considering the great trouble, anxiety, and expense he had had in the matter, and also looking at the fact that much more onerous conditions might, not unfairly, have been demanded, seeing that had it not been for the spirited action of Mr. Peter Watson the whole of these three well-known and most valuable setts would have been probably lying idle at the present time, without much chance of recuscitation.

The chief points in the scheme of amalgamation and re-arrangement of capital are as follows:—The liquidators of Tankerville—for, necessarily, in order to carry out the reconstruction it was requisite to place the company formally in liquidation—were authorised to sell the property and business to another company, to be formed for the purpose of purchasing and working the plant and machinery of the Tankerville, Bog, and Pennerley Mines, with a capital of not less than 110,000*l*., consisting of 110,000 shares of 1*l*. each. Of course, this "other company" has now become a *fait accompli*; and, in passing, a word of commendation may be given to the inventor, or suggestor, of the name of the new company, inasmuch as the title of "Tankerville Great Consols" very happily conveys a notion of the great magnitude of the concern, and also implies that the property consists of setts formerly worked separately, but now consolidated under one management. It is proposed that 36,000 of the shares, of 1*l*. each, shall be offered for subscription in the first instance to the old Tankerville shareholders; on these 36,000 shares of 1*l*. per share it is not anticipated that more than 5*s*. per share on application and 5*s*. on allotment will be required to be called up in the next six months, as this amount it is expected will provide ample funds to pay the whole purchase money for Bog and Pennerley plant, and also the Tankerville debts (not very much), and still leave sufficient for working capital for the above-named period. Indeed, some acquainted with the properties are sanguine enough to believe that not a much larger amount than this may be required to be expended—at any rate, not for a considerable period. In the event of the shareholders of the late Tankerville Mining Company not taking up all the 36,000 shares on or before Nov. 8, it will be in the discretion of the directors of "Tankerville Great Consols" to allot them to other applicants. There is no doubt from what we can learn that all the old Tankerville shareholders will most readily and gladly apply for and pay on their proportion of shares; but, as Mr. Peter Watson pointed out at one of the Tankerville meetings, there may be a few executors and trustees who cannot legally take up their proportion, and if this be the case it would be a considerate act on the part of the board of the new company to allot the overplus shares to those old shareholders of the Bog and Pennerley Companies who may feel desirous of taking an interest in the new undertaking on the favourable terms indicated in the prospectus. It is known as a fact that there are scores of old Bog and Pennerley shareholders who would be but too glad to avail themselves of the opportunity of associating themselves with Tankerville Great Consols, and even giving a premium to secure an interest therein. It is next proposed that 36,000 shares of 1*l*. each shall be allotted, fully paid up, as a bonus—share for share—to the persons who subscribe for and pay the sum of 1*l*. per share on the first-named 36,000 shares, and in consideration of their so doing. Then it is proposed that a further 36,000 shares of 1*l*. each shall be allotted as fully paid up shares among the shareholders of the Tankerville Company in the proportion of three shares for one, according to their present holding in Tankerville, as part of the consideration for the transfer of the property and business of that company being made to the new company, and on the new company taking upon itself the payment of the debts and liabilities of the old Tankerville Company, together with the expense of winding-up the same. This leaves 2000 shares to be disposed of; of these 1000 will be allotted fully paid up 1*l*. shares, and applied in part payment of the purchase money of plant and machinery in Bog and Pennerley Mines, whilst the remaining 1000 shares will be allotted fully paid up, and applied (instead of cash payment) towards the expenses incidental to the formation of the Tankerville Great Consols.

Those who keep themselves *au courant* with mining matters are aware that these three extensive runs of mines now to be consolidated into one property, have proved highly metalliferous, the same as have also the celebrated Snailbeach, the Roman Gravels, and other productive mines situated in this rich lead and blende mineral district of Shropshire; but there are numbers of persons whose acquaintance with the district may be limited, and who may, on reading that this is a resuscitation of suspended mines, run away with the idea that the mines temporarily ceased work as much from scarcity or poverty of ore as from lack of funds. Now no greater mistake than this could be made, and it is only right that any (if there be any) misapprehension which may exist on this point should be corrected by a brief narration of the results of past working. In Tankerville, in the last ten years, there has been sold 14,190 tons of lead ore, for 189,145*l*., and 58,000*l*. paid in dividends, besides 25,000*l*. to 30,000*l*. spent for machinery and dead work. There are now four steam-engines on the mine. In the year ended June 30 last 1050 tons of lead ore were sold, for the sum of 11,036*l*., being an average of over 87 *tons per month*. The quantity of ground opened up in the ten years in sinking shafts and winzes, driving levels and cross-cuts, stoping, &c., was 5316 fms., and the average yield of lead ore for the whole was nearly 2½ tons per fathom. The mine is in full working order, and is sunk 220 fms., the pitwork is in first-rate condition from top to bottom, and some important discoveries of ore are expected almost daily. The value of this mine alone as it stands is estimated by the manager of the Roman Gravels Mines as being worth 50,000*l*. As to the Bog, the late company sold nearly 1500 tons of lead ore, for about 20,000*l*., and 1770 tons of blende, for 8520*l*.; and is said that when suspended, for want only of a small amount of funds, the mine was capable of returning 60 to 70 tons of lead ore per month, and about 150 tons of blende per month. The mine is only 175 fms. below adit, and as a going concern the plant and machinery (four or five steam-engines) are valued at 5500*l*. With regard to Pennerley, the late company sold lead ore and blende for about 60,000*l*., and at about the time the works were suspended the returns of lead ore were from 70 *to* 80 *tons per month*. The mine is only 130 fms. deep under the adit level, and the machinery (four steam-engines), which is valued at 4000*l*., is also all ready to be set to work in a week's notice. When the water is out of the Bog and Pennerly Mines, which can be quickly done, there is no reason why Tankerville Great Consols should not sample from 240 to 250 tons of lead ore per month (being a larger quantity than even Van or Roman Gravels is now doing); and it is estimated further that, in addition to the 250 tons of lead, from 250 to 300 tons of blende per month may be returned from the enormously rich lodes and courses of ore which are ready for development.

It is known to be the intention of the directors to avail themselves of the most modern appliances and machinery for the extraction and treatment of the ore. In all probability the directors will shortly see their way to the introduction of boring machinery; and as the great saving of time and labour effected by these machines is but imperfectly appreciated or understood even by many practical miners, it may not be out of place to give briefly the comparative results obtained by machine and manual labour. The materials for this comparison are supplied in an able speech by Mr. Peter Watson at the recent meeting of Great Laxey shareholders in the Isle of Man, of which celebrated company he is the London director. Mr. Watson has always been a consistent advocate of the adoption of rock-drills in mining development, and has over and over again urged upon mining companies the importance of getting as many of these drills as possible to work. At Devon Great Consols, of which wonderful company he is the Chairman and managing director, he introduced rock-drills with great success and benefit to the company. To show the practical and economic value of these rock-drills, Mr. Peter Watson stated that by mannal labour it is possible to drive an end in hard ground (say) at the rate of 1½ fms. per month, or at the rate of 18 fms. a year, simple drivage in one end. Of course, this could be multiplied by any value of the lode per fathom, but for the purpose of simple illustration Mr. Peter Watson took it at 20*l*. per fathom, which would make 360*l*. a year. It is generally calculated that in every fathom's driving 10 fms. are made; so multiplying the 360*l*. by ten a total of 3600*l*. a year is attained as the result of a year's working in laying open ore ground by manual labour in one level only. Now compare this with the rock-drill. With the rock-drill it is possible to drive 5 fms. per month, as compared with the 1½ fm. by hand labour; multiply the 5 fms. by 12, and the result is 60 fms. as the year's drivage, as compared with the 18 fms. by manual labour. Multiply the 60 fms. by the value, 20*l*. per fathom, and the result is 1200*l*. of ground opened as against 360*l*. by manual labour, and multiply the 1200*l*. by the amount of the reserves, 10 fms., and the total is no less than 12,000*l*. as the result of the year's working by machinery, as compared with 3600*l*. by manual labour. Mr. Peter Watson clearly pointed out that these figures show conclusively that by means of this machinery three or four times at least as much work can be accomplished as by means of manual labour. Additional rock-drills are now being put to work at Great Laxey. Of course, if there were 30 ends driving of the same value there would be 30 times the amounts stated

A not unimportant feature in connection with the working of "Tankerville Great Consols" is that a considerable reduction has been obtained in the amount of royalty paid to to the lords. Hitherto the royalty paid in these mines had been 1*l*. per ton, or 1-12th royalty; but Mr. Peter Watson, by his continned and persistent exertions during the past two years, has, it is understood, at last obtained what will be a great boon to the incoming shareholders in the united company—a reduction of the royalty on a liberal scale, equal to 1-16th or 1-17th royalty, and for the first two or three years the royalty will be even on a much lower scale. Of course, such a concession is no more than shareholders, who intend vigorously to prosecute the mines, should expect to receive. At the same time none the less credit is due to Mr. Peter Watson for the pains, trouble, and expense he has been at in obtaining this substantial reduction, and most of the shareholders will only hear of this for the first time this week.

In reviewing the operations of some of the larger lead and blende enterprises during the past few years, one is struck with the remarkable fact that resuscitation seems to have been the order of the day, and in the majority of cases these resuscitations have resulted in gratifying success, or in great promise for the future. A few cases may be taken at random. Some years ago the Minera Lead Mining Company, whose property is situated at Wrexham, was reconstructed, and fresh capital had to be applied for. It was understood at the time that there was some difficulty in obtaining this fresh capital, but in the end it was subscribed (and put into 9000 shares of 5*l*. each); the working of the mine was pushed on with energy, and what has been the result? Minera proved itself one of the most remunerative lead and blende mines in the country; the total dividend paid per share amount to 68*l*. 13*s*. 2*d*., or over 616,000*l*., and the 5*l*. shares (or 45,000*l*. capital) are now marketable at about 12*l*. per share, or over 100,000*l*. Then, again, there is the Great Laxey, which we have before mentioned. Some years ago this company was reconstructed with a capital of 15,000 shares of 4*l*. each (60,000*l*.), all of which has been fully paid. On each 4*l*. per share the shareholders have received in dividends 26*l*. 14*s*., or 400,000*l*.; the selling price of the shares is now 18*l*. per share, thus giving to the mine a market value of about 270,000*l*.; and not only has Great Laxey given these gratifying results to the shareholders, but its success gave direct benefits to the working men and tradesmen in the locality. The returns of profits in both these mines have been from lead and blende, and this will to a considerable extent be the case from the three united mines of Tankerville, Pennerley, and Bog, in the latter of which enormous quantities of blende are known to be standing, which can be returned very quickly and cheaply, and at considerable profit. Then the Van may be cited as an instance of a successfully resuscitated lead mine with a sufficient capital. In this mine it was necessary to increase the capital, which now stands at 15,000 shares of 4*l*. 5*s*. each, or capital 63,750*l*. A return of 24*l*. 18*s*. per share (or 373,500*l*.) has been made in dividends; the shares are now quoted at about 19*l*. per share, which would give a total marketable value to the mine of about 285,000*l*. Another instance of a mine which has been successfully restarted is to be found in the Roman Gravels, which is contiguous to Tankerville Great Consols. This rich mine was stopped for no less than 25 years; it was then restarted and worked on a comparatively small scale, but the results were sufficiently encouraging to induce Mr. Peter Watson and two of his friends (the late Mr. T. C. Munday, of the Stock Exchange, and the largest Van shareholder, the other gentleman being Mr. T. Southgate, the present solicitor to the Tankerville Great Consols Company, Limited) to purchase the property for, it is said, the sum of between 60,000*l*. and 70,000*l*. They were then instrumental in forming it into the present Roman Gravels Company, with a capital in 12,000 shares of 7*l*. 10*s*. each, or 90,000*l*. Already the amount paid in dividends has been 8*l*. 1*s*. per share, or 96,600*l*., so that the shareholders have received back more than the amount of the capital invested, and in addition very large sums of money have been expended out of revenue in the development of the mine, the improvement of the dressing-floors, and the introduction of the most modern appliances and machinery, under the able management of Capt. Arthur Waters, who has been manager since the purchase of the property. The shares are now selling at 10*l* per share, so that the present market value of the mine may be put down at about 120,000*l*.—a very low figure for such a property. In fact, it may be said of Roman Gravels that it is one of the finest and most promising lead properties in the kingdom, as there are immense reserves of ore, which it will take many years to work away, and these reserves are being kept up as the work of development progresses. It may be mentioned that the three setts of Tankerville Great Consols are situated about midway between Roman Gravels and Snailbeach, in the latter of which mines dividends have been almost continuously paid for a period of about 100 years. Some time ago explorations at the deeper portion of Snailbeach were suspended, but recently operations were recommenced at that point, and now at the very bottom of the mine—at about the same depth as the Tankerville deepest level—they have a magnificent lode, which is reported to be worth 8 to 9 tons and even up to about 10 tons per fathom. This has caused great life in the district, and bears out the statement of a correspondent in a recent number of the *Mining Journal*—that all the mines in this wonderful rich mineral district are comparatively as yet in their infancy, and that as depth is attained still better results may be expected, as well as exploring in drivages of the shallower levels. We are given to understand that the management of Tankerville Great Consols Company (Limited) will be entrusted to one who is justly considered one of the leading lead mine managers of the day—Capt. Arthur Waters, manager of the neighbouring mines, Roman Gravels.

The list of successfully resuscitated lead mines might be greatly enlarged in different parts of the country, but sufficient has been said to show that in regard to resuscitation and profitable working metalliferous mines differ from almost every other kind of industrial undertaking. In banks, financial institutions, and large trading concerns, when a time of difficulty comes, and their credit is "blown up," to use the slang phrase of the day, they succumb, with scarcely a chance of being revived. In the case of a mine the circumstances are entirely different. It may be grossly mismanaged, it may fall into disrepute with the public, and in the end the works may be closed, and the company working it may go into liquidation. But all this in no way affects the inherent value of the property. Deep in the bowels of the earth lie hid those metalliferous riches which only require the magician's wand in the shape of a moderate amount of capital, energy, and practical mining knowledge to render them available for the use of man

One word may be said regarding the price of lead, the depression in which has had such a blighting effect upon the lead mining industry of the kingdom. It is the opinion of those who are best qualified to judge that not only will the recently advanced price of lead be maintained, but that in all probability within 12 months the remunerative prices which prevailed a few years ago will again be obtained—that is to say, that instead of the low price of 10*l*. to 11*l*. per ton which lead ore is now fetching, it will again command the price of 15*l*. to 17*l*. per ton. Prices of nearly all metals are rising, and lead must follow.

Looking, therefore, at the conditions and auspices under which "Tankerville Great Consols" is about to be re-started, a doubt can scarcely exist that there is a very prosperous future before it, and it would not be very unsafe to prophesy that in the not very distant future a marked improvement will take place in the value of the shares. When the purchase of the Bog and Pennerley Mines is completed, Mr. Peter Watson will be invited to join the present experienced board of directors, and this strong addition to the management will tend to give increased confidence to the shareholders; and it may be safely said that Mr. Watson and those associated with him will commence their onerous duties with the hearty good wishes not only of the shareholders but of all those who recognise the important fact that to her metalliferous riches Great Britain is in no small degree indebted for the leading position which she occupies amongst the industrial nations of the world

## FOREIGN MINING AND METALLURGY.

There has been little change in the Belgian iron trade; business has generally remained dull and depressed. No further orders for rails or iron on American account appear to have been received in Belgium. Prices of iron are at a point in Belgium at which makers begin to complain that they are scarcely remunerative, especially having regard to the rates current for pig and coal. Luxembourg pig is now about 8*s*. per ton higher in Belgium than it was during the late crisis in affairs. Ordinary plates are quoted in Belgium at 6*l*. 16*s*. per ton, and they might probably be even obtained at 6*l*. 12*s*. per ton. The Athus Works are about to introduce the Thomas-Gilchrist process. Steelworks have been decided on, it may be added, at Thy-le-Chateau, the company owning those works being no longer able to make a good profit out of the manufacture of mere iron rails. As regards the Acoz Works, a scheme of transformation is said to have been proposed, but nothing definite has yet been decided on. A contract has been let for 700 pairs of wheels for the Asturian railways; two-thirds of this order was secured by German firms, and the remaining third was retained at Angleur.

The sale of coal continues active at Paris, and prices remain at about the same level as last week. The general tone of the German coal trade is favourable. Deliveries are continually increasing, especially as regards coal for domestic purposes. Some colliery proprietors have raised their rates 5d. per ton, and others have made a still further advance. The demand is also increasing in Germany, and it is expected that rates will be advanced.

In the Haute-Marne the demand for iron does not lose its importance, and having regard to the period of the year there is a large amount of activity in the trade. Rolled iron from coke-made pig has brought 7*l*. 4*s*. to 7*l*. 8*s*. per ton, while mixed iron has brought 16*s*. per ton more. The foundries of the Haute-Marne are generally active. In the Nord prices have been generally maintained without alteration. In the Muerthe-et-Moselle refining pig is offered up in small lots at 2*l*. 8*s*. per ton. The Austrian iron trade has experienced little change, but the markets have been generally rather weak. In Germany merchants' iron has been in little demand, and prices have been rather tending downwards. Plates, steel rails, and wire have been also a little lower. The German rail mills have held their ground pretty well, having received from the United States orders to the amount of at least 50,000 tons.

The state of the Belgian coal trade continues favourable in almost all respects. In anticipation of a somewhat hard winter, consumers are laying in considerable supplies of domestic qualities of coal. Prices appear to be tending upwards; at any rate they exhibit a hardening tendency. While the demand for coal is generally satisfactory in Belgium the same cannot be said of means of transport. In the Liége basin transports are made, upon the whole, with regularity, but the state of things is not equally business-like in the Mons group. There trucks begin to become scarce, and boats now almost entirely make default. The deficiency in the supply of trucks is not considered to exceed 20 per cent. of the number required, so that complaints are not very urgent at present. The absence of boats is due to the fact that the last two years have not been a remunerative period for boatowners. Freights have fallen to a very low point, and the consequence has been that very few new boats have been built. The number of boats is accordingly declining from year to year, and the reduced number which still remains is almost entirely absorbed by the Pas-de-Calais and the departments of the North of France, which are always served before the Hainaut districts. Stocks are forming to some little extent in the Borinage, but prices have not suffered from this at present.

## Original Correspondence.

### ON COKE MAKING—No. II.

SIR,—Although several patents have been taken out for the construction of coke ovens with a view to the utilisation of the waste heat, and to prevent the dispersion of ammonia and other products —100 tons of coal in the process of coking is said to produce somewhere about 6 tons of sulphate of ammonia, the quantity varying with the coals used—yet none of these patents have been successful in practice in this country (excepting, perhaps, in isolated cases), and the common beehive oven still retains its supremacy as of old as the best medium for the production of a fuel of good quality. The reason of this is that the circular and dome-shaped oven is found to produce the most equable and uniform quality of coke. There are no corners where the coal, owing to its not being brought sufficiently under the action of heat, is produced in a worthless or unsaleable state. The writer had under his charge the construction and working of 120 oblong ovens. These were connected to flues and chimnies, and the coke was drawn out bodily by an anchor and winch, and then watered outside. The coke produced was of excellent quality The wearing of the anchors is an objection to this system; but there was a greater saving by avoiding the injection of water into the ovens, and its serious consequences.

BEEHIVE OVENS.—The coke from beehive ovens being drawn with difficulty by manual labour, and cooled previously by injecting water into them, the consequence is the heat of the walls of the oven is so much reduced that a considerable time is lost before the coal ignites again, besides the damage to the lining of the oven occasioned by pouring water upon it. However, it must be admitted the beehive oven derives its pre-eminence from the uniform quality of coke made, and the high percentage of good coke turned out. Different sizes of ovens are adopted at collieries—10, 10½, 11, and 12 ft. diameter, and 7½ ft. in height at the crown. The most common size is 11 ft. diameter. An oven 10½ or 11 ft. diameter is less affected by the great changes of temperature to which this form is subject than a 12 ft. oven, though the latter will produce a denser and better sized coke.

After the injection of probably 1 ton of water into the oven previous to the batch of coke being drawn, and the time taken in drawing and refilling—say, two hours—the heat of the oven must be greatly reduced. When charged again the oven is carefully sealed up both at the door and at the opening at the crown. In the course of four or five hours the oven has gathered heat, and "strikes" or breaks into flame—sometimes around the sides, in other cases over the whole surface of the coal, this depending on the manner of charging the oven, whether at the top or at the door. In the latter method the coal—large and small pieces—is more equally mixed. With filling at the top the larger pieces of coal and shale run to the sides, which tends to produce weak coke, and thus there is generally more waste with side coke under this mode of filling than the former; but where the coal is previously crushed there will obviously be little difference resulting from these two modes. In the further process of coking the flame becomes less red, smoke ceases to come off, and as the coal is gradually being coked downward the flame becomes brighter in appearance, diminishing until the process of coking is completed to the bottom; at the later stage the admission of air at the door is curtailed, so as to avoid any waste of carbon. When the flame has ceased the coke is ready to be drawn, and should any delay in effecting this occur the openings at the door should be sealed up in the meantime. There will frequently be observed a thin stratum of uncoked coal at the bottom of the oven; this coal has probably become too dry before the fire from above reaches it, resembling somewhat the nature of steam or other non-coking coal.

Of the construction of the oven and flues it may be observed that the ovens in a row should be built close together, so that when an oven is just charged heat from the adjoining ovens will be rapidly communicated to it. In the lining the best fire-bricks, 9 in. long, are used, cemented with fire-clay. Over this are laid two 4½ courses of inferior bricks, joined together with mortar. The dome part of the oven has no further covering than this down to 2 ft. vertical from the crown. Below this the space between the ovens and flues is filled in with rubble masonry and mortar, and with the front walls all the work is built so that each oven is impervious to the entrance of air except at special openings provided for its admission. It is highly important that the ovens stand on a sound and dry foundation, more particularly when high chimneys form part of the arrangement. For chimney foundations the earth should be removed until solid clay or rock is reached, otherwise the stack will soon begin to incline over, even so much as to require rebuilding. A chimney stack of 120 feet in height from the bottom of the main flue, to draw from 100 ovens with foundations, has been known to cost about 1000*l*. The foundation—on account of the soft nature of the ground—being required to be laid 20 ft. below the surface, entailing a cost of about one-half the sum named. The arrangements in this case included the heating of three or four boilers with the products of combustion evolved from the ovens. Various methods are adopted in placing the main flue. In several cases the base of the main flue is made to be 1 ft. below the top of the rubble wall before referred to; and between a double row of ovens may be 4½ ft. in height by 3 ft. 9 in. in width, divided by a 9-inch wall in the middle, thus forming a separate flue for each side of the double row of ovens. The main flue is sometimes enlarged gradually towards the chimney. But where the heating of boilers is designed the main flue should be of much larger dimensions—say, 8 ft. in height and 3 ft. in width. The eye at the back of each two ovens in opposition, and the branch flue, should join the main flue in different directions, so that no obstruction is caused by the current of gases from each. The draught from (say) 100 ovens can be regulated by adjusting the size of the eye or outlet from each oven to the main flue, according to its distance from the chimney. The branch outlets in this case are built in the rubble masonry. A cast-iron damper is placed in each of these outlets to shut off the draught entirely when required. No opening is required at the top or crown of the oven, unless it is charged at the top; when that is done this opening is closed and luted with clay. When the charging is performed at the door this opening is not usually required. But exceptions to this are found, as when the branch flue is taken from the crown of the dome to the main flue, and above the rubble masonry. This arrangement admits of charging either at the door or at the top. Both methods are in practice, The damper in this case works over the eye at the crown. When ovens are charged at the doors a railway is laid along the front of the ovens 4 ft. 8½ in. gauge, on which chaldron wagons with hinged bottoms convey the coal. This railway may also be carried on a gantry of the height of the rubble masonry. The operation of drawing coke is thus not interfered with, while the charging of any other oven can be proceeded with.

A chimney of 16 ft. square area and 64 ft. high will cause a draught to serve 32 ovens, the draught being regulated by the size of the eye. The flue and chimney create a steady and regular draught; a larger quantity of coke is produced and of better quality than was possible to be made with unflued ovens. The usual charge is 6 tons of coal per oven for three days' burning, and 7½ tons for four days' burning, or 13½ tons per week, the yield of coke varying from 58 to 61 per cent. It must be understood that the produce of coke will vary with the constituent elements of the coal used; a bituminous coal with a large percentage of volatile matter ignites quickly, and generally produces a good coke. The cost of building an oven, 10½ ft. diameter, may be, including rails and pillars for top filling and water pipes, about 26*l*.; add main flue and chimney 60 ft. high and workmen's gear, 6*l*. 10s. = 32*l*. 10s. The cost of Gantries, rails and sleepers for top of ovens, and tubs to carry 1 ton of coal, will be to add to this: rails 56 lbs. per yard. Notwithstanding the advantage the beehive oven possesses in the quality of coke produced, it has several drawbacks, the principal being the necessity of injecting water into the oven before the coke can be drawn; the length of time required for this operation, two hours or more, and the low heat produced in the walls of the oven when it is charged anew, considerable time being lost before the coal strikes into flame; the consequence is that a portion of the volatile gases escape, and carbon is lost, which do not act in raising the temperature of the oven and coking the coal, though they may afterwards be utilised in the main flue for heating boilers. The walls of the oven are greatly strained by the alternate expansion and contraction of the brickwork consequent on pouring water into an oven where a temperature of about 2000° has been maintained. There are competing systems to that just described, such as the oblong oven, with anchor; the Coppée oven, and others, which may sooner or later supersede the beehive form. These it is proposed to describe in another article.

The great object with ironmasters is to make a good quality of iron. Pure coke is essential to effect this end; its hardness and density are qualities essential to the purpose for which it is used, when the strong blast and heavy burdens brought to bear on coke in blast furnaces at the present day are considered. There is no doubt that all coal is improved by washing and crushing, previous to being coked; for some coal the washing of it is a necessity before good coke, tolerably free from sulphur, can be obtained. Coal washing machinery will come into more general use as competition necessitates a more careful preparation of the coal before it is used for coking. It may be observed that the water associated with washed coal has a marked effect in improving coke; this is probably due to the action of steam engendered from the water in the process of coking.

M. E.

### COAL CUTTING MACHINERY.

SIR,—In an article published some time since in your valuable Journal I find mention of several coal cutting machines, among which the writer gives favourable mention to those of Messrs. Firth, Mr. F. Hurd, Messrs. Gillott and Copley, and Messrs. Rigg and Meiklijohn of Leeds. Being desirous to inform myself upon the various coal cutters in the market any aid your readers may afford in the shape of additional information of these machines and their performances will be an especial favour, as the only clue I have of the above is through the *Mining Journal*. I trust you may pardon this encroachment on your space.

I may mention that this company (the Colorado Coal and Iron Company) is now conducting some experiments with the Lechner under-cutter, the results of which have not yet demonstrated fully its economy in getting our soft coking coal. As a machine it is a success, however, and in the hands of a skilled man and two assistants will undercut 2 ft. wide by 5 ft. deep in from seven to eight minutes; 4 in. of coal are reduced to a powder, which for coking is no disadvantage, however.—*Colorado, Oct.* 25.

L. TAYLOR.

### LONDON AND PARIS COAL SUPPLY.

SIR,—The minutes of evidence before the Select Committee on Coal show that seaborne house coal suffers a deterioration through breakage to the extent of 2s. to 2s. 10d. a ton (*vide* pp. 284 and 285) from Durham to the Thames. Apart from breakage, when conveyed in trucks from the pits to consumers' premises by special manipulative appliances in loading and discharging in common use in the London docks and wharves, infinitely greater dispatch is ensured, enabling a much greater number of voyages to be made in the year, thereby reducing the working expenses to a minimum. As far as the railway is concerned the evidence of the engineer in chief of the North-Eastern Railway, past president of the Institute of Civil Engineers, states—"The whole secret of a railway being able to do a large business depends on the trucks being emptied with dispatch." The evidence of the general manager of the Midland Railway states the promoters of the Hull and Cudsworth line who received coal in Hull, had their coal impeding the circulation of the line four, five, and six days. By the system proposed the trucks will be emptied immediately into barges, giving the railway company the most perfect control over the unloading—a *sine qua non* of their finding wagons (*vide* Answer 10,284). He further stated, at Hull there is six-fold the time for standing of wagons as compared with Tyne Dock. A general report by Captain, now Sir Henry, Tyler states—"Goods trucks, under the most favourable conditions, are less than half their time in motion; mineral trucks, perhaps, not one-sixth of their time." As the wages, sinking fund, repairs, and insurance, amounting to upwards of 75 per cent. of the entire working expenses, are identical whether few or many voyages are made in the year, it is evident the number of voyages performed is the great secret in the coal trade, corroborated by the Transactions of the Society of Civil Engineers, vol. xiv.; further, by the evidence of an eminent Durham coalowner before a Committee of the House of Commons, and equally so by the chairman of the South Yorkshire and North Derbyshire Coalowners Association, who in answer to Question 3993, Great Eastern Railway Bill, stated — "Dispatch cheapens immensely the cost of sea transit."

This month's Coal Exchange Return shows a decrease in railway transport this year to the extent of no less than 382,133 tons, with a corresponding increase of 87,027 tons seaborne. As to the land and sea carriage of coal in sacks, the minutes of evidence before the Select Committee on Merchant Shipping this year, which have been carefully perused, in addition to my assisting at several sittings of the Committee, prove that an ordinary coal truck can convey more coal in sacks than in bulk, as far as stowage is concerned, which has been fully proved. Trucks not suitable for the conveyance of coal in bulk can be utilised for the transport of coal in sacks, which is a point of considerable importance for railways, and of vast benefit to them. The coal will be screened at the pits when the screenings are not weighted with rail transport, shipping charges, freight, City dues, lighterage, and a higher rate of carriage. No inducement will exist for sending half-screened coal to the consumers. As I have found it imperatively necessary to make myself acquainted with the minutest details of manutention and manipulation, from descending into the bowels of the earth to the delivery into the consumers' premises, I have witnessed on the banks of the Thames, in filling the sacks, one man filling screened coal and the other man filling the sack from the unscreened truck without any such operation. Consumers will be ensured to have no such contravention of common honesty exercised by the proposed company. As a member of the Committee on Coal stated (7331), "May it not be that the trade of so-called "Forty Thieves" is as honest a trade as yours?" addressing himself to a leading coal merchant. This class must be and will be annihilated with the formation of my undertaking.

W. J. THOMPSON.

*Ramsgate, Nov.* 9.

### PESTARENA GOLD MINE.

SIR,—While the Journal statedly brings before the public eye the periodical yield of various mines from month to month, a further purpose of perhaps somewhat higher and more practical utility may possibly sometimes be served by looking, when practicable, into the relative results these returns exhibit when contrasted one with another. The Pestarena Company having of late been but little brought under anything approaching to prominent notice amid the varied brilliant prospects and expectations which just now abound in regard to new properties, it may not be uninteresting to mark the present progress attending the working of an old standing enterprise. An examination of the returns from the Pestarena and Val Toppa Mines shows that whereas, dating onward from July, 1879, only twice during 12 months was a produce obtained exceeding 600 ozs. per month, from July to October of this year, each of the four months has shown a total well in excess of that quantity—about 650 ozs. each in July, and August, and almost 700 ozs. in September and October, the latter month lacking less than 5 ozs. of that total (although the produce of the Val Toppa stamps, an essential proportion of that mine's yield, is not included in this month's return). The progress of the average yield of gold per ton of ore treated during the same period also shows a most gratifying advance, having been after 11 dwts. 17 grs. in June, for July 12 dwts. 19 grs.; August, 12 dwts. 14 grs.; September, 13 dwts. 13 grs.; and October, 16 dwts. 19 grs.

These figures showing results hitherto unequalled such a chain must be admitted to furnish something more upon which to base future hopes and expectations than a merely exceptional spirit of momentary success, which might provoke the reflection, "one swallow does not make a summer," and cannot, I think, fail to be welcome to the general body of shareholders to notice should they not all have maintained that scrutiny of the details which would bring it under observation. That it has, although existing, not been generally perhaps known—or, at any rate, appreciated—the comparatively neglected and depreciated position and value of the shares would at least seem to indicate. In estimating the immediate future prospects of these mines it is also worthy to note the encouraging feature that the new mills in course of erection are now fast approaching completion, and thus promise in a month or two to contribute an added quota to swell the yield of gold henceforward.

*Nov.* 10.

A SHAREHOLDER.

### MINING IN SPAIN—ASTURIAS.

SIR,—Desirous of having a more intimate knowledge of the topographical and geological features of the western portion of Asturias by reason of the numerous reports of its mineral wealth which had reached me, I availed myself of the several occasions that offered in my journeyings amongst the mountains to examine and note their respective phases.

STARTING FROM OVIEDO TOWARDS GALICIA.

Oviedo is the capital of the province of Asturias, formerly capital of the kingdom of that name. Its population is 34,900. Its cathedral dates from the eleventh century. It is constructed mostly of dolomite, and is in an excellent state of preservation. It has some fine pictures, and its altarpieces are very costly and beautiful. It contains within its walls the tombs of nearly all the Asturian kings up to the date of its union with the Crown of Castille. The heir presumptive to the Spanish throne enjoys the title of Prince, or Princess, of Asturias, and is supposed to make a pilgrimage to Oviedo. It has a fine aqueduct, constructed at the expense of a former bishop some couple of centuries ago. There is here an important government small arms manufactory, and at a distance of about two miles from the city a powder manufactory, which supplies the miners throughout the province with very good explosive. There are several gypsum quarries about Oviedo, worked occasionally for sufficient stone to supply the local requirements with manufactured *yeso* (plaster of Paris).

A fine turnpike road of the second order, well looked after, connects Oviedo with the west, passing by Cornellana. On leaving Oviedo by this road we have on the right hand a hill crowned by immense masses of carboniferous limestone. This hill has several coal crops taken up from government as mines, though there is only one in work: this supplies the capital and surrounding villages with fuel, which is filled into sacks at the mine, and taken on the backs of horses or mules, and hawked for sale. A steam tramway traverses the mountain from the railway station to the Santo Firmo iron mines, which are worked for the government factory at Trubia.

On the left of the road, or *carretera*, rise the majestic Pyrenees stirrups, each with a local name. About three miles from Oviedo on the side of one of these ridges, a copper mine was worked for a short time some 25 years ago. It consists of various lodes, running nearly parallel—direction W.N.W. to E.S.E. I had picked from the cattle a sample bag of about 1 cwt., which when triturated and sampled yielded by rough assay 15 per cent.

I learned that this mine had been abandoned by the proprietor after the attempt to work it as one that could not pay for working. The mineral it yields consists of a patchy band of pyrites, interspersed through the lode in specks and small masses, surrounded throughout by a good bed of oxide and thin lines of carbonate of copper, the whole lode interlying in oxide of iron, also interspersed with copper carbonate. As the proprietor had no knowledge of mineralogy, other than visual, he endeavoured to dress out the shining yellow pyrites, throwing away as iron the richer parts, consisting of the oxides. Finding that he could not work this with any advantage he abandoned the mine.

The predominating adjacent rocks to these lodes is limestone of the Devonian formation. At the foot of these hills there is a small lode of a rich mineral, which at sight was set down by an English engineer, who passed some time in this province as realgar, but which on being tested in a close tube with sodium carbonate yielded very fine drops of mercury. This lode is carried in a bed of calcite.

Following the *carretera* from Oviedo onwards about five miles we come to the celebrated warm sulphurous baths of Caldas de Oviedo, noted for the remarkable cures of rheumatism that have resulted from their use. Here the topographical formation changes its direction from west by a sudden bend northwards. The River Nalon, flowing at the foot of the range, follows here the sudden bend. On the southern side of the river, at some distance from same, the Quiros ironworks stand. They were idle for some time, but at present they are again in work, and additions are being made, including a steel making department, reported to be after the Bessemer system. This addition I have not yet seen. Along these mountain ranges there are found abundant deposits of iron ore, some of which are good, assaying 50 per cent. Fe., with only about 6 per cent. silica and practically free from sulphur and phosphorus; but others are bad, assaying 45 per cent. Fe., 30 per cent. Si., and up to 1·50 P.O.

As a rule the laboratory is more neglected than it should be in the Spanish ironworks. As a consequence of this neglect, it is reported that the aforenamed ironworks smelted down a quantity of this bad ore, choked their furnaces, and sent the resulting pig-iron to stock until an attempt was made to work it up and to sell, when it was discovered that the stock was worse than useless.

On the banks of the Nalon, some miles further N.W., we come to Trubia, the government heavy ordnance factory, with its rows of workmen's cottages, all pleasantly situated, with an immense range of mountains rising on either side of the Nalon—bare, rugged, and frowning. Following the *carretera* westward, in the range on the left, there is a very fine galena lode, just being opened out by a Gijon merchant, who intends putting up a cupola to smelt the ore into pig on the spot, since coke can be secured placed in the Oviedo station at 4 reals per quintal=18s. 4d. per English ton: and as he will only have to cart it some seven miles, and since he has on his property plenty of poor iron ore and other fluxes, he has but little doubt of making it pay. This galena is clean, and contains about 5 ozs. of silver per quintal of ore, equal to 112 ozs. per English ton. There is also in the same property a very fine grained iron pyrites which yields about 2 ozs. of silver per quintal of ore. My time did not permit my making an extensive investigation of this range, but the appearance of the lode, and of the adjacent rock—limestone—being regular throughout, I expect to find that other workings will be opened on it, at a distance on either side, and this may become another Spanish silver-lead producing district.

From Trubia the *carretera* follows the course of the Nalon to the town of Grado, distant from Oviedo 25 kilos., a place which (with the surrounding villages included in its municipal district) contains 10,200 inhabitants. This town is built on a vast alluvial bed, which here measures about two miles in width. The whole of this is laid out in small plots, highly cultivated, and thickly planted with fruit trees, which in spring and summer gives it the appearance of a vast lovely garden. The *carretera* passes through a fine avenue of limes, acasias, and sycamores for a mile on either side of the town. Two excellent iron ore deposits are found about three miles nearer Trubia from Grado. These are worked by their owners under contract with the government works at Trubia, where the ore is carted to be consumed. A railway is now in course of construction between Oviedo and the above works, for the transport of materials and passengers.

Before reaching Grado the *carretera* and river cross an upheaval of ferruginous quartz. The river seems to have worked its way through the mass, which on either side rises to a height of about 200 ft., nearly perpendicularly. A pillar of this has been left standing between the road and river of about 50 yards at its base, the road having been carried through it by blasting. This river was long ago noted for the particles of gold found in the sands along its margin. Whether this quartz reef has any other metal than a small portion of iron I have not yet ascertained.

No finds of any importance in metallic lodes from Grado to Cornellana, distant about nine miles, have come to my knowledge.

At Cornellana the *carretera* branches on the left to Belmonte and on the right to Pravia, the main road continuing to Salas, Espa and Luarca.

The road to Belmont passes along the left margin of the River Narcea, as we travel towards its source. This river in summer has only a depth of about 2 ft. in its normal parts; whilst in winter, owing to its sharp fall, it has a current enormous alike in body and speed, sweeping before it all obstacles, until it forms a junction with the Nalon, about two miles above Pravia, from whence the

is very gradual, and the body of water very broad, until it falls into the sea at San Esteban de Pravia, a port where ships can lie safely during both winter and summer. Following this road for six miles to Puente de San Martin, where again there is a branch, and taking the one that follows the Narcea for a distance of about two miles, we cross the river, and reach the Castanedo, a village on the margin of the river, and in the lovely valley that has been formed by its alluvion. From Cornellana to this, on the right margin, there is a continuous chain of hills, forming the boundary of the valley of the Narcea. Some of these are well covered with vegetable soil, and cultivated or planted with chestnut, walnut, and other fruit trees to their summits. Others are rugged and bare, with regularly stratified eruptive felspathic rocks, underlying limestone and marble, both smoky white and fossilised brown. About three miles up from Cornellana there is a rude dressing machine put up to prepare these for table tops and other furniture purposes, as well as for building purposes. Motive-power is obtained from the river, and were the requirements a hundred times as great they could be supplied from the same source.

*[To be continued in next week's Mining Journal.]*

## GOLD MINING IN THE DUTCH WEST INDIES.

SIR,—Permit me to concur sincerely with Mr. Chumaceiro when he observes in his last letter that it is entirely indifferent to the general public whether he has a "portly form" or is a "salaried agent," &c., so long as his statements are true; but he will allow me to add that it is equally indifferent to the general public whether my "name," which he seems needlessly anxious to see at the end of my letters, is Jones, Brown, Robinson, or anything else, so long as *my* statements are true. My complaint against him is that he slyly put himself forward in your columns as a disinterested and impartial person anxious only to acquaint possible investors with the "advice" he had given to his friends, whereas he was (as he has since admitted) the hired agent of the enemies of the Aruba Mining Companies, and only wanted to give those companies a stab in the dark. He makes a great merit, apparently, of giving his name and address, as if the name and address of an unknown foreigner living abroad were of the least interest to your readers, or added strength to his letters.

I have again to tell Mr. Chumaceiro that the Aruba Island Gold Mining Company is simply engaged in converting its bonds into shares, and is making no application, still less holding out any "inducement to the public." It is a purely private and domestic matter with which the public has nothing to do. I have also to say that no "decision" of the Dutch High Court is possible, because no litigation is possible as to the right of the alleged agricultural grantees to the Aruba "Phosphate" on the grounds they claim. Litigation is conceivable, aimed at preventing either the Colonial Government or its concessionaire from moving the phosphate from those grounds, but even if that litigation were successful it would confer no right on the phosphates. No mineral right can be obtained in Aruba, as Mr. Chumaceiro well knows, without a mineral grant from the Government, and the Government has bound itself to the phosphate concessionaire not to give further grants of any kind on the phosphate grounds. No one but the present concessionaire can, therefore, possibly get any right over the Aruba phosphate, and the Colonial Government has taken good care that the exploitation shall proceed, because otherwise the Government would lose the large royalties which the "colonial chest" badly needs. That the Government has the right to take up all agricultural grants in Aruba, if required for mineral purposes, is clear from the fact that the Government has given the Aruba Gold Mining Company the right to mine on all such grants, and the company has often exercised that right. The Government, therefore, can give the same right to the phosphate concessionare that it has already given to the gold mining concessionaire, and it justly ridicules the idea that it cannot do so. But, in truth, it is useless discussing this question, because the alleged agricultural grants are undiscoverable.

As to Mr. Ashmead's letter, I am glad I have elicited the statement that the Alliance Phosphate Company's capital is "available at any time required." If that company chooses to spend some of the "available capital" in claiming at law the right of the "dog in the manger" from the Government of Curaçao, Mr. Chumaceiro will be doubtless gratified, and I certainly shall not be displeased.

*Nov.* 2. A LATE RESIDENT IN THE COLONY.

## THE EMMA MINE.

SIR,—Enclosed is a paragraph from a Chicago paper, which I should be glad to see in the Journal. I think the readers of the Journal interested in the Emma Mine will gladly peruse it. W.

*Plymouth, Nov.* 9.

The Chicago Mining Review, speaking of recent developments in the Emma, of Utah, says: "For years the Emma Mine has been a synonym for fraud and the basest swindling operations. Now development proves that the mine itself is one of the richest in that rich territory, and all the blame should be cast upon the incompetent and shameful mismanagement. Some idea of the wasteful methods of doing business may be gained from the fact that the ore from the waste dumps has been worked over three times at a good profit."

## FLAGSTAFF SILVER MINING COMPANY.

SIR,—The secretary of the Flagstaff Silver Mining Company of Utah (Limited) seems to have betrayed no little anxiety of late in communicating the result of certain interlocutory proceedings taken by us on behalf of our clients, the importance of which he magnified beyond all reason. It is significant, but perhaps scarcely to be wondered at, that the secretary did not communicate the result of the three petitions which came on for hearing before the Master of the Rolls yesterday. These petitions were presented by the solicitor of the company, an ex-director, and our client, Mr. Bamberger, a creditor for over 12,000*l.* The two first petitions were supported by the company, which opposed that of Mr. Bamberger, notwithstanding which his Lordship made an order for the winding-up of the company on the petitions of the company's solicitor and Mr. Bamberger, and gave the carriage of the order to our client, making no order on the petition of the ex-director.

FREDERICK WM. SNELL AND GREENIP.

*George-street, Mansion House, London, Nov.* 9.

## MINING—PRACTICAL AND THEORETICAL.

SIR,—I am glad to see that the "Practical Miner" has once more found his voice, but he gives a very lame excuse for not having replied to my letter, or to that of "Nemesis." He did not think that a reply was necessary, and his time was partially employed in writing on matters of greater importance. The "Practical Miner" is correct in implying that it is not necessary to reply when one has been thoroughly worsted in argument, it is discreet rather to be silent Your correspondent may, therefore, be congratulated on his discretion. He would even have shown practical wisdom if he had maintained an unbroken silence. He tells us that he only writes against theoretical mining when he has nothing else to do, and when he is tired of reading. One can readily understand, from the "Practical Miner's" style of writing, that he is very soon tired of reading; and if, as he says, he spends most of his time in reading and writing, it is astonishing that so much labour should produce such miserable results. Your correspondent is inclined to fall out with "Gold not Gilt" because the latter has the audacity to advocate any theoretical knowledge at all. He again affects to sneer at the efficacy of lectures on mining, showing conclusively that ignorance and bigotry are by no means easy to tear out when they have once taken firm root. He also avers that a student might as well look at a piece of mahogany as endeavour to learn anything from the examination of a piece of granite.

But a "Practical Miner" is woefully mistaken in supposing that a piece of granite is as meaningless to the student as it is to the former. To the student it has a wonderful composition, and a wonderful history; it reaches facts that would fill a very large volume—a volume that would take the "Practical Miner" the best part of his lifetime to read. According to the latter and others, if he wishes to become that extraordinary animal, the "thorough-bred miner"—that is, I suppose, if he wish to attain any proficiency in mining—he must work underground almost directly he is out of long clothes, until he has reached the age of strong manhood—or, more truly, until his lungs are irretrievably impaired by his unhealthy employment. But this notion is antiquated and absurd. It is true that miners may work underground all their lives and still be perfectly ignorant of everything except the use of the borer, the pick, and the shovel, and a good many of them are so. But those miners who wish to excel in practical mining must study the sciences that lie at the root of mining; and they never will excel in mining until they do so. Knowledge is as necessary to them as practice is to the purely theoretical student.

Your correspondent says that I have given a long dissertation on slides in my last letter, the long dissertation took up exactly twelve lines. He further declares I stated that the law attending slides varies in different districts. The old knack of misrepresentation still forms part and parcel of the "Practical Miner's" logic. I did not use the word law at all. I said the rule which the miner applies in a certain district very often does not apply in another district. The imperial rule of a miner does not constitute a law. Such a rule may be useful in a certain district, but is often worse than useless in another district. Finally, your correspondent threatens to write me a lecture on heaves and slides. The "Practical Miner" may write as much and as long as he pleases on heaves and slides, but I do not promise to read his effusions. Your correspondent may know everything under the sun, and, in his own opinion, he evidently does, and a good deal more, but it is a pity that he did not study his own mother tongue before he attempted to rear for himself such a vast fabric of knowledge —— E. HALSE, A.R.S.M.

## PRACTICAL MINING VERSUS THEORY.

SIR,—"Practical Miner," in his letter last week, in alluding to my letter of Oct. 16 on Practical Education for Miners as applied to Mine Management, misquoted me in the following manner:—"That to teach the miner, or a boy to be a miner, he should hear lectures on mining, and have specimens of ore-bearing rock—say, granite—put into his hands to examine." On perusing that letter it will be found that, in referring to geology, I stated thus:—"My plan for the education of the miner would be this—with a well-selected collection of specimens of the different rocks which are known to contain different minerals . . . . teach him that granite is granite, and what minerals are found in it, and how they occur in different classes of granite, &c., teach him how to distinguish one rock from another, and this cannot be done in any way better than a lecture on it when he has a piece of the rock in his hand." Anyone reading that letter in a proper manner would readily preceive that I referred to granite in a general not in a special sense, and that I made no reference to the composition of granite, but only to the ores that are likely to be found in that class of rock. If "Practical Miner" left off reading sometimes before he got tired perhaps he might have a better conception of what he had been reading, and the object for which it was written. As much criticism as you like Mr. "Practical Miner," but do not misquote and pervert. —— GOLD NOT GILT.

## THE MINERAL SPRING AT LEE, NEAR ILFRACOMBE.

SIR,—There seems to be an idea just now amongst the public who visited the little watering-place of Lee, near Ilfracombe, this last summer, that the mineral spring in the rocks above the "Broad Ore Beach" is similar to the springs at Bath and Cheltenham. I beg to say I have had the water tested which oozes out of a blue vein about 2 ft. wide, and it is quite different, being more like the German waters, with a mineral salt taste without any effervescence whatever. The temperature of the atmosphere was at 9 A.M., 47·30°; at noon, 49°. The same day at Ilfracombe—9 A.M., 47°; noon, 48·5°. The same day at Torquay, "Babbicombe"—noon, 48°. The same day at Clifton—9 A.M., 43°; noon, 47°. The same day at Barnstaple, the Institution—9 A.M., 43·5°; noon, 46·5°. R. G. S.

*Forest Hill, Nov.* 10.

## TIN BOUNDS.

SIR,—In the county of Cornwall two distinct rights of mining exist; the first is the ordinary right of the proprietor of the soil, who, as such, is *prima facie* entitled to get minerals from under any portion of the same. This title the owner has except where, as is often the case, the person from whom he or his ancestors purchased the land has reserved the mines with the rights and privileges of working them. This may be called the ordinary or common-law right as distinguished from the rights we are about to describe. The other, or second, is a customary right confined to tin, in respect to which it is peculiar to this county, and has there existed from time immemorial. Cornwall has been productive of tin as an article of commerce from remote antiquity, and it is admitted by all historians that it carried on a trade in tin with the Phœnicians many years before the Christian era. How far the Phœnicians interested themseves in the management of the mines, and whether they did anything more than purchase and exports the tin, we do not know, but it appears from Polybius, Diodorus Siculus, Pliny, and others that the Romans traded hither, and probably taught the inhabitants how to improve their methods of working the mines and modes of obtaining the ore. Diodorus Siculus, lib. v., says—"The inhabitants of that extremity of Britain which is called Bolerion both excel in hospitality, and also by reason of their intercourse with foreign merchants are civilised in their mode of life; they prepare tin working very skilfully the earth which produces it." Roman coins, sepulchris, and sacrificial instuments have been found near to old tin mines and stream-works. A block of tin of a singular form, with an inscription in Roman letters, was discovered in the parish of Vergan, and wooden tools of antique form which have been dug up show that these people may have worked the mines themselves, or at least superintended the labourers in them.

The Saxons had no authority in the county until its conquest by Athelstan, and the Danes allowed them little leisure for mining operations The Danes were too much occupied with defending the lands they had acquired to give their attention to this source of wealth and profit. Whether before the Norman invasion the tin mines belonged to the Crown or were enjoyed by the landowners we do not know, but it is unlikely that they long escaped the rapacity of the Norman tyrants. Accordingly we find that there is a record in the black book of the Exchequer, in the year 1198, containing expressions which show that the Stannaries (from *stannum*, tin) were the demesne lands of the Crown, and all the tin both in this county and Devonshire was the undoubted property of the king himself. At the same time under some grant or lease, called "Firma de Stannariis" (made by the Crown long anterior to the above date), the tinners had *confirmed* to them certain privileges, including the "Bounds" right, of which they had long been in the enjoyment. This appears from a return made by the sheriff to two writs or precepts, issued in the year 1198, above named (9 Richard I.) by the primo ministo and the Barons of the Exchequer, in which it is stated that "all miners, tin merchants, and smelters, and all future dealers have rights and ancient customs and liberties as before in Devonshire and Cornwall."

By the first of these writs the sheriff was required to give all the Stannaries in charge of William dè Wrotham, the King's Commissioner, to cause him to hold the stannators in the same "freedom which they both ought and are wont to have." And the sheriff is commanded "to have such loyal men as he should name to assist him in taking charge of the stamps (income) of the lord the king, and all the revenue of the Stannaries, and to dispose of the profits of them. By the second of these writs or precepts the sheriff was to summon juries to enquire into the weights of the meltings of tin, and accordingly dè Wrotham and the persons signing the return to this writ certify that in this year (9 Richard I.) they enquired concerning the just weight of the tin in Devon and Cornwall, and found that "for every block weighed by the greater weight (100 lbs.) there were given to the king from ancient custom 30 pence for the farm (rent) of the Stannaries in Devon. And that for every block weighed 100 lbs., as above) in Cornwall 5s. for the king's rent or composition." Upon payment of these duties the tinners were at liberty to sell their tin where they liked, unless the king choose to purchase it, in which case he had the right of pre-emption. The right of pre-emption was granted to favourites of the king, and again underlet, and became the source of monstrous oppression, to the extent that on the accession of King John the tin "farm," or duty, amounted to only 100 marks, or 66*l.* 13s. 4d. In consequence of this disastrous state of the revenue of the Stannaries, John by a charter (which was the first charter the tinners had) granted that whilst the miners should work to the advantage of his "farm," they might at all times freely and quietly, without the disturbance of any man, dig tin and turf to melt the tin anywhere in the moors and fees of bishops, abbots, and earls as they had been accustomed; might try wood for melting of the tin in the precincts of forests, and divert water-courses for their works in the Stannaries, as by ancient custom they were wont. The tinners were by this charter greatly encouraged, and the rights of "bounding" or "limiting" certain pieces of ground by single individual or by parties of miners were more extensively practised than before. The bounds were little pits, about a foot square and a foot deep, dug at the angles of the piece to be mined, sometimes containing an acre and often more. It was thus enclosed by imaginary straight lines drawn from pit to pit, so as to include the whole plot to be mined. In these modern times it is not frequently that the ancient rights of bounding are followed by the tinners, but the owner of the soil, or in the case of the moor lands the Duke of Cornwall, grants what is named a "sett" to the parties who join in the adventure. J. N.

*Manchester, Oct.* 29.

## THE GREAT FLAT LODE.

SIR,—I notice with great pleasure the various rich discoveries of tin made on this lode during the last few years which has given to the renowned tin district of Cornwall, as it were, a new series of tin mines comprising Wheal Grenville, South Frances, South Condurrow, Wheal Basset, West Frances, &c., situated on the southern slope of Carn Brea Hill, similar to the old world-wide renowned series of tin mines on the northern slope of this mountain—Dolcoath, East Pool, Tincroft, Carn Brea, &c. South Frances paid dividends on copper for many years, then became poor, and remained so for several years. During the latter period the sinking of Pascoe's shaft was continued with a view to cutting the great flat lode, which was met with about three and a-half years ago at the 185 fm. level, and shortly after a good discovery of tin was made at this point, and the mine resumed paying dividends, notwithstanding the very low price of tin at that time, and continued to do so until July last. This shaft was found inadequate to discharge the necessary quantity of debris and ore as well as for the proper drainage of the mine, ventilation thereof, and for the men entering and leaving the mine, the ladders being dangerously approximate to both pumping-rod and skip. It was, therefore, proposed to enlarge it, and put up a new pumping engine, with new pitwork, &c., which would have cost about 7000*l.* This, unfortunately for the permanent welfare of the mine, has not been carried out, and consequently, by influential mining authorities, it is said in order to keep up the dividends the reserves of the mine have been seriously infringed on—*i.e.*, picking the figs out of the pudding; or instead of working the ground fairly away, taking high-grade and low-grade ore as it naturally occurs in the deposit, it has been overrun, as it is termed, leaving the low-grade ore for a future operation, which, of course, gives a very brilliant first result, whilst the after crop not only produces a very dreary one, but by twice working over the ground in this way the labour cost is nearly doubled.

The machinery of the mine is very old and badly worn, consuming consequently twice as much coal as new machinery would, therefore a great outlay is required to replace it. The project now—as the drainage is effected by a long crooked run of flat rods underground, which are constantly breaking—is to sink Marriott's shaft, on which the pumping engine is situated, to the 185 fm. level, which it is estimated will take two and a-half years to accomplish, consequently no relief can be expected until then, and they have to trudge on as best they can with the gear they have during that time. These drawbacks, coupled with the fact that the sinking of Pascoe's shaft has been almost in abeyance for a long time past, in consequence of the defective drainage, and likely to continue so during the next two and a-half years, caused some time ago a firm of influential and practical mining gentlemen to withdraw from the concern, fearing a collapse of the dividend and a return to calls. However, the rise in the price of tin gave it a temporary relief, but if it is really true that the richest part of the mine is becoming fast exhausted, and no sinking going on, which we have every reason to believe is the case, it is certainly a most dangerous investment, and those who look solely at the dividend in estimating its value, disregarding its condition, will probably find themselves in the same box as the Turkish bondholders ere long, unless a rich discovery or a great rise in the price of tin comes to their relief. It has also been projected to remedy this defect by an amalgamation with its neighbour, West Basset. This would require a shaft to be deepened 200 fms., which at 3 fms. per month would take over five and a-half years, and the same at 50*l.* per fathom would cost 10,000*l.*, including labour and material, besides the purchase of said shaft, engines, pitwork, winding gear, land, &c., together about 18,000*l.* or 20,000*l.* We do not, therefore, see how this can benefit South Frances in the least, but believe the deepening of Marriott's shaft to be the best thing to do, and should have been resumed as soon as the said discovery of tin was made. Had this been done the mine would now have been in the desired position for which it has now to wait two and a-half years; but unfortunately, like the project of enlarging Pascoe's shaft, it has only been talked of up to the present time. With these two objects accomplished, which as stated above will take two and a-half years, and proper machinery throughout the mine, or (say) an outlay of 20,000*l.*, it would then be in a position, probably, to resume dividends in something like a permanent form.

The adjoining mine, to the west of South Frances, is Wheal Grenville, similarly situated as regards the great flat lode, which after passing through South Condurrow underlies into this site at the 90 fm. level. In speaking of the former it will be well to bear in mind that the latter has made profits of over 46,500*l.* in a comparatively short time. It (Wheal Grenville) also takes the same lode from a portion of West Frances sett at about the same depth, and this mine has paid good dividends also, and opening well for tin at the present time. These together give Wheal Grenville about half a mile on the course of the great flat lode, with the whole of the ground tested for about 90 fms. above it, and proved to be rich for tin. In the mine immediately above the present workings (South Condurrow) the lode is being profitably worked throughout the whole length of the sett right down to the boundary, or 90 fm. level, so that the ground may be said to be thoroughly tested to this depth, and the manager very reasonably expects richer ground as he gets deeper, this being the case in all tin mines. South Frances, as above mentioned, met with the rich tin ground at the 185 fm. level, and this mine (Wheal Grenville) is now about the same depth, and expects to cut the lode in two months' time at the 190 fm. level, where it is naturally expected to be found rich also. There are six ends driving, four eastward towards South Frances, and two westward, five of which are in profitable tin ground, and the sixth is expected to enter the same course of tin daily 12 fms. deeper, where, of course, in consequence of the greater depth a great improvement is expected. This mine (Wheal Grenville) in contradistinction to its neighbour, South Frances, is furnished with the most modern machinery, and of ample power to cope with its requirements, requiring only a small outlay of 250*l.* for a stone-breaker to complete the arrangements, which will increase the crushing power of the mine 35 per cent., and reduce the dressing cost about 30 per cent,, and will evidently bring the mine into a permanent dividend state. The underground operations are in a thoroughly satisfactory state, being expedited by boring machinery, and further ventilated by the aid of two shafts.

During the last quarter it made a net profit of 655*l.* 11s. 10d., and at the meeting the Chairman, Mr. R. W. Goold, remarked that it was a long lane without a turning, and their concern might now be said to have come to a turning point. Four years ago it was losing 400*l.* per month, but in face of that a large expenditure had been made, so that the mine might be made a dividend paying one. Half a year ago he stated his belief that before the year was out the mine would be placed in the Dividend List, and he was now happy to say that his assertion had been amply and fully justified by the result of the last three months' working, and he believed the ore would turn richer when they got down in the lower levels—the 178 and 190 fm. levels—the latter of which they hoped to reach before the next meeting. They would remember in one run of ore ground there was a fair run

of some 25 fms. in length, the bulk of which was worth 40*l.* per fathom. By this time it was expected they would have got into another rich run of ore ground, and that was probably not far ahead, as the ends were advancing towards South Frances. They had never had anything worth getting until the ends got away from the shaft a little, and there were two or three points, one in the 150 the other in the 165 fm. levels, which would give them better results before the company met again.

I may say, in conclusion, I have asked the opinion of mining authorities who have lived in the district all their lives, and their opinion is unanimous that it is the future mine of the district.

*North Shields, Nov.* 4. ——— WM. NANCE.

## SIMPLE PROBLEM.

SIR,—Capt. Knapp is nearer the mark this time, but still not quite correct. The excuse that he did not understand the question is not a good one, as if he did not understand it he should not have undertaken to answer it. No one else seems to have found any difficulty of the kind, and Capt. Knapp himself seems to have comprehended it on taking a second look, so that by his own admission he has been guilty of writing without thinking. How the question arose need not concern him—the way to solve it is what was asked; but the fact that it did arise in practice shows that there are cases beyond the range of even his extended experience. Capt. Knapp guesses rightly that I found his letter amusing, and so said—not exactly my "aunts and my cousins" but—some fellow Cornish X-iles in the great Metropolis. I had hardly expected that so large a trout was going to rise to so small a fly. For the future I would advise him to "For a moment think what meagre profits spring from pen and ink," and see if he cannot find a more profitable outlet for his superfluous energies in developing the latent resources of the mine or mines honoured by his care. X.

## A SIMPLE PROBLEM.

SIR,—It is astonishing, nevertheless very amusing and interesting, to find there are those who in their hurry to jump at conclusions without waiting to understand what they read, or for what object it is written, will rush forward to prove themselves right and others wrong inasmuch as they can do. In my letter on the above subject I stated plain enough, "I give you here a simple practical solution, and as it will in part demonstrate the system of practical information I would impart to working miners," &c. The answer I gave was a practical one—32 tons nearly. How I arrived at the correct answer I did not explain, I left it to others to find out by stating, "Anyone wishing to find the correct answer, &c." No mine manager or agent would in his report say I shall have exactly 31·8181 tons of 25 per cent. ore at the next sampling; he would put it in this way, I shall have somewhere about 32 tons, &c. I made no pretence to give the exact quantity, as I know it is never given that way in practice. I gave a simple practical solution with a simple practical answer, and a simple practical proof that it was right; and the same rule will hold good for any other question of a similar nature, and it proves itself at the same time, and also shows in a manner how theory and practice may be applied together. It is more easily learned and as easy to apply, and the result is as practical as that of any other method. I did not send it for the purpose of showing off my arithmetical qualifications. There was a time, though, when I used to feel very anxious for the day to come when my weekly paper would arrive, and very proud when I saw "correct" before my name, &c., but that ceased when I had to turn out and earn my own bread and cheese, and since then I have turned the "reasonings of my untrained mind" to the "roundabout and erroneous methods" best suited to the practical requirements of life.

As to "X." calling the mine officials ignorant, I beg his pardon. I inferred from his letter that they could not arrive at any satisfactory solution. If they were even able to arrive at such an answer as I gave, and could prove that they were right, they could not have been so very ignorant after all, and it would have been quite sufficient and satisfactory for all practical purposes. Any means by which you can arrive at the desired answer is, and may be properly so called, a solution. ——— GOLD NOT GILT

## A SIMPLE PROBLEM.

SIR,—Although admittedly wrong in my figures respecting the solution of a "Simple Problem," I still maintain that it is not a practical question, inasmuch as nothing of the kind ever occurs in practice. Whoever pretends to say concerning any quantity of orestuff about to be dressed that a specific quantity of waste shall be evolved therefrom containing a certain percentage of ore, and concludes that, therefore, a specific quantity and quality of the dressed ores will be obtained? These are matters of calculation, based on men's judgment and experimental tests, and not on problem, however simple and elucidative. The practice and methods employed in the sampling of gold, silver, or tin ores before being submitted to reduction do not meet the case, nor does the miner's mode of estimating the value of ores *in situ* meet it. It is a problem rigid and arbitrary, as all such problems are, and has never, so far as I am aware, been formulated as a preliminary to practice. The calculation of losses in the dressing of ores which have been assayed or otherwise tested before they have been submitted to the ordeal of dressing is based upon previous practical results, and not on abstract problematical conclusions. The silver and gold miner, however, estimates the percentage of loss from what has occurred in the treatment of similar ores under similar conditions, and so, I presume, does the tin miner. Experience teaches him that losses occur in the treatment of various ores of variable percentages from the assay or other test valuers, according to the methods employed in their reduction, and the character and quality of the ores, and he exercises his judgment accordingly, anticipating a percentage of loss in proportion to whatever ideas he may arrive at and entertain from all considerations, having the test values and his past experience to inform and guide his judgment. Let us take a case. It is under consideration as to whether or not 100 tons of 10 per cent. ore would or would not realise a greater value by being further reduced. It would then be necessary to estimate the cost of their reduction, and the probable loss which would accrue therefrom; but no precise answer could be given to the question until the experiment was made. If the concentrated quantity amounted to 30 tons of 30 per cent. ore a loss of 1 per cent. would be shown, and 30 tons deducted from 100 tons would leave 70 tons as waste, which, supposing it to contain the entire loss sustained in the operation, the waste might be estimated to contain 1·42,857 per cent.; but who would ever think of relying on that estimate if contemplating the further treatment of them. How much might there not be lost of the original quantity which would not be found in the tailings. Has not the solvent power of water much to do with the question, and then take into consideration its power and capacity of suspension, and its agency as a vehicle for transit. I ask "Mine Agent" if the method I have here laid down is not the practical one for arriving at the facts, and if it is of what use is the problem referred to? He has stated in effect that it is of practical utility, will he be good enough to afford us some evidence of the genuiness of that position, it would be much more interesting and effective than his mere *ipse dixit*, which amounts to nothing. He could string a few figures together to show that I was wrong in my conclusions respecting the problem, but he would have done better to have solved it himself, and given the solution, but that I presume he was not able to do, or he certainly would have done it, as he was in all honesty bound to do before vilifying another for failing in the attempt; but, lacking the ability to do that or anything better, he resorts to personalities, and denounces me as "hypercritical." As to whether I sustain that character or not my letters to the *Mining Journal* from time to time will sufficiently attest, but if he adjudges well-merited reprisals entitled to that designation he is welcome to entertain and apply it. One thing at least he may learn from them. I do not conceal myself in ambush to shoot an opponent in the back, if I did so he would have had some difficulty in preferring such a charge against me. I would like to ask him if he is at present engaged, as he made some reference to his method of estimating values, but I very much question that he was ever required to officially make any. He may have exercised himself in respect thereof with his pencil and slate, just like an urchin I once came across in a secluded place, airing his oratorical proclivity, haranging a regiment of old tree stumps. I shall say nothing of the manner of his exit, but he did not stand on the order of going, he went. It appeared an intelligent audience, and was what he had not bargained for. How is it with "Mine Agent?" I hope he will not evaporate in ebullition, exclaiming "Comparisons are odious." The performance of "D. B." bears so unmistakeably the impress of juvenility as to exempt it from serious criticism; indeed, there is nothing in it to criticise or reply to. It is true it betrays a precocity which justly entitles it to a mild rebuke, but its effusion of irony is effectually counterpoised by the playfulness of its satire The ludicrous point in the performance is that its concocter assumes himself to be the man and me the juvenile. It would be a pity to dissipate his reverie, and deprive him of so innocent an enjoyment. I shall, therefore, permit him to luxuriate in dreamland until he awakes of his own accord, or some other circumstance. ——— ROBERT KNAPP.

## THE GRATUITY BUSINESS.

SIR,—I am very glad that you have lifted up your voice against this business, which seems to me most objectionable as regards this last instance of it at South Frances. I for one most decidedly object to the payment of a gratuity of 100*l.* to Capt. James, who appears to have been in the receipt of a salary considerably—one may safely say 50 per cent.—above the average of that paid to Cornish mine managers; and even if he is one of the best agents going still I for one see nothing in the state of the mine as he is leaving it to entitle him to so marked a token of gratitude from his employers.

*Nov.* 10. ——— AN "OUT ADVENTURER."

## TIN MINES IN CORNWALL AND THE ANTIPODES.

SIR,—The discovery recently made in Mount Carbis within 27 fms. from surface, of a lode of tin worth 50*l.* per fathom, all in new ground, sufficiently verifies the correctness of my views with regard to tin mining in this county—that we need not go diving into deep, watery, expensive old mines. Let the deep mines that are already at work, and are sufficiently rich to work at a profit, with the moderate prices for tin that we are likely to obtain for some time to come, be continued of course; but to open up afresh deep, old, expensive mines at present is folly. There are a sufficient number of good tin mines near the surface for the present generation, and probably for that coming immediately after us. If we wish to hold our ground against the surface deposits that are being found in Tasmania, Australia, and a few other places, we must avail ourselves of the beneficent arrangements which Nature has placed before us, enabling us to work under nearly equal advantages with those who have the rich surface deposits in foreign mines. Our new mines may not be found so near the surface quite as theirs, but they are near enough for us, with all our advantages of cheap skilled labour, &c., to secure equal profits out of them. If we look at Mount Bischoff, which in six months months ending June 30 last paid 30,000*l.* in dividends, leaving a credit balance of 35,572*l.* 17*s.* 2*d.* with which to commence operations for the present half-year, we find even there a mine not nearly so rich as some of our Cornish mines. In order to secure this magnificent result they have to extend their operations over much larger surfaces than we ever dream of Cornwall, and to smelt their own tin. This, too, is done in a severe climate, and with a rather expensive labour market.

There is no doubt that we shall continue to receive large quantities of tin from Tasmania for years to come, although there is a possibility of the constancy of the supplies being sometimes temporarily disarranged by the very extensive discoveries of gold now being made in many parts of the colony. Then we have to expect pretty much tin from the east coast of Australia, but their roads are bad, water sometimes scarce, and labour expensive. We may calculate on getting moderate prices for tin for some time to come, and it is decidedly in our interests that efforts should be made towards steadying the prices and minimising the extent of the fluctuations.

This being so, we must turn our attention to opening the shallow mines, many of which are now pretty close under our feet, and only require the persistent and well directed eye of practical science to discover them. In these shallow Cornish mines, when fairly selected, the pumping charges are light, the ores often of high percentage, the ground easily and cheaply wrought, roads good, and the materials required obtainable at moderate rates, so that now we see what we have before us we ought to be able to run along side by side with the production of these antipodal mines, making nearly as good profits as they can do. That this will prove to be the case in Mount Carbis there is not the least doubt, and moreover I believe that equally good results are likely to attend one or two others that could be named. In view of the competition we must experience from the immense enterprise now everywhere manifested in opening foreign mines, the healthy permanence of Cornish mining must largely depend on our care in selecting mineral ground by the light of practical experience.

In a future communication I purpose giving you some remarks on Mount Bischoff as compared or contrasted with Cornish mines, and to note their divergence and similitude, for although some of us would, perhaps, be glad if no such mines were in existence, inasmuch as we have been affected by their large production, it may do us good to see how their position has been attained, especially if, as I opine, that may help us to see how here to secure equally magnificent results from richer lodes and more advantageous positions.

*Redruth, Nov.* 11, ——— W. TREGAY.

## EAST CROWNDALE MINING COMPANY.

SIR,—It was with great pleasure I noticed in last week's Journal that a company has recommenced the working of this property, which I see now includes the two properties locally known as Rixhill and Anderton. Having occasionally visited Tavistock and the adjoining confines of Dartmoor on the east as a health resort in summer I have followed the bent of my inclination, and wandered slowly through or over the several mining properties which abound in this region. It has been to me a source of great astonishment that a mining property of such great value should have laid unworked; indeed, I do not know where to look for a run of mining ground in any degree to equal it. To the west or west by north you have Devon Great Consols, which is known to all the world, and many mines around it. From that point coming eastward there is Wheal Crebor, which has held a good place in the mining world for some time, especially since there was added to it a portion of what was for many years known as Crowndale Mine, out of which some of the largest fortunes now enjoyed in the neighbourhood of Tavistock have been made. Crowndale House is famous, too, as the birthplace of Sir Francis Drake, one of Queen Elizabeth's sea heroes. The Crowndale property tends eastward to the River Tavy. The ore ground working in Wheal Crebor passing under the River Tavy enters that portion of East Crowndale which is now being worked by the East Wheal Crebor Company. I have not for many years seen so rich and valuable a pile of copper as I saw on the floors of East Crebor quite recently, and which they are daily adding to by raising this ore from the 60 and 70 fm. levels, and that within only a few fathoms of Rixhill boundary. Travelling eastward these Crebor lodes, formerly regarded as the Crowndale lodes, pass entire in maiden ground into Rixhill and Anderton Mines, and which I am glad to see announced as being to be worked as East Crowndale Mining Company's territory.

But quite independently and apart from these Crebor lodes the East Crowndale Company have a property of exceptional value. Within their boundaries they have two copper lodes, to the south and parallel to the Crebor lodes, which have been worked upon both in Rixhill and Anderton, but only to a small extent; nevertheless, to such an extent as to prove the strong champion character of the lodes. A little further south, but, as far as I have yet learned, only in the Anderton sett, a very large and powerful lode has lately been discovered, and only awaits to be worked. As far as my information goes, this is a tin lode, and up to surface is of great promise. The tin lodes in Rixhill and Anderton are well known, and champion lodes of great strength and riches. The shaft in Rixhill has been sunk some 40 fms., and levels driven east and west. The ore ground has also been reached by an adit level about 17 fms. from the surface. These lodes trend east into Anderton, where they have also been worked to a small extent, although I believe the eastern shaft has been sunk some 80 or 90 fms. But between these two setts there is a piece of rich tin ground of some 40 or 50 fms. in extent laid open whole waiting to be taken away. And so from the 30 to the 80 in Anderton the tin ground is understood to be whole. This tin ground is opened ready to be attacked so soon as the Anderton shaft is in fork; so that whether we regard these two properties from the point of view suggested by their copper discoveries so rich in East Crebor "just over the hedge," or by their tin riches, as in Rixhill and Anderton setts, I really do not know where you can find a piece of mineral ground at all equal to the East Crowndale Company's property, or, indeed, fairly to be compared with it; and the parties holding shares in East Crowndale are fairly to be congratulated if not envied.

The properties are noted as having running through them cross or caunter courses, one in particular running nearly north and south from Crelake, on the north passing through Wood Town, Walreddon, and Sir Massey Lopez's property still further south. The Crelake Company worked this lead lode some years ago at not far from the point at which it enters the Anderton sett, and in cutting through it in the Anderton adit level, which is 13 fms. below the Rixhill adit, silver lead was raised of a quality and richness which would make any mine a prosperous concern. This lode has not yet, I believe, been further developed, and is therefore entire, so far as this company's property is concerned. I hope, with such a property in hand, the Eastern Crowndale Company will have enterprise fully to develope their riches.

It has become a kind of fashion to decry English mining properties, and run off to foreign countries to seek an investment for English capital. Well, "far off birds have fair feathers;" but I venture to assert that the mining districts around Tavistock have an extent of undeveloped mining ground which, if fairly worked in depth as it should be, and one day will be, will yield enormous wealth to those who, content to keep their money at home and have it spent under their own eyes, have the judgment and foresight and persevering enterprise to study, and in an intelligent manner turn their attention to these districts, and aid such undertakings as I see embodied in East Crowndale Mines. ARGUS.

## CORNWALL MINING INSTITUTE.

SIR,—A circular was sent two or three months ago to the members announcing that an excursion would take place on a given day. After that another circular was sent stating that "circumstances over which the committee had no control" rendered it obligatory to postpone the excursion, but that a fresh appointment would be made for it. No such appointment has been made; and, as the winter has arrived, I presume it will not be made for this year. It may be that the President wished to save the expense which it would cost him to imitate the example of the late president, who gave the entertainment at Portreath.—*Redruth, Nov.* 9. ——— A MEMBER.

## WENDRON, AND ITS MINES.

SIR,—Any person who had visited the Wendron district 15 or 16 years ago, and has not been there since would, if now to go there, be rather surprised to see, instead of a great many engine-house stacks emitting large quantities of smoke, a score or more of dilapidated buildings; one of the most eyesore spectacles I know in any mining locality. I should think with present price for tin that some of the old mines would be a good speculation. I hear that one at the higher part of the district—the Calvadnack—has resumed working. I remember some time ago having a conversation with an agent of that mine, who told me that nearly all the time he was connected with the concern they paid their working expenses and sometimes made small profit. I was quite surprised to hear him remark about the average quality of all the tinstone broken in the mine. He informed me it would produce 5 per cent. for tin, that is 1 cwt. of black tin per ton of tinstone; this, I should suppose, would be equal to any other mine in the county. The mine, as far as I can learn, was not suspended on account of unproductiveness, but owing to the low price for tin at that time. Garlidna Mine was some years worked on an extensive scale, and after having a great many thousand pounds expended on its development had to be stopped owing to its non self-supporting. Wendron Consols, after many years' hard struggle, ceased working. I have been informed that a little south of the old mine there is a separate tin lode, which was only seen at a very shallow depth, which is spoken of as being exceedingly rich. This could be worked with the aid of a small portable engine, which would be of quite sufficient power to explore the lode 20 or 30 fms. deep, it being quite an independent lode from the old mine. East Lovell, or a part of it, is still working, but nothing has been seen like the rich deposits of tin in the old mine as yet. I inspected a part of this mine, which is now working, some time since—the Sevorgan part; I saw there as likely looking lode, about 13 fms. from surface, as any miner would wish to look upon. I have been expecting to hear every week of some good discovery here. The Lovell does not seem to be in the same productive channel of ground as some of the mines around; we have seen good reports but not much results. I believe I am right in saying the company have not met with sufficient quantities of tin to meet their working expenses since the management of the late Capt. Nancarrow. I should think from what Captain Nancarrow did here, his opinion was that the dip of the tin would soon be out of the Lovell sett, hence his application for the adjoining piece of ground, where he sunk a perpendicular shaft about 40 fms., and intersected the deposits of tin that had left the Lovell Mine at this depth. I believe this mine is still working, called Combellack, and managed by Capt. Curtice, the Duke of Leeds' mineral agent, but with what success I cannot say. There are many other mines that might be mentioned, but I must let these suffice for the time. T. R.

## WEST CHIVERTON MINE

SIR,—I was rather astonished by reading a statement in Captain Southey's report presented to the shareholders in the above mine at their meeting on the 19th ult. Referring to the driving of the east, he says, "Going east in this direction we have a piece of unexplored ground for 100 fathoms long, containing the same lodes which proved so productive in the western part of the mine. In speaking of this part of the sett there is another very important feature I would call your attention to, and one which I consider should not be lost sight of—a north and south (or caunter) lode will come in contact with the east and west lode, which we are now driving on about 45 to 50 fms. east of the present end. What effect this will have when the two lodes form a junction remains to be proved, but I may here add that all practical miners feel a deep interest in lodes when they are coming together, especially when crossing in opposite directions."

This statement surprised me, as I understood the piece of ground spoken of had been thoroughly explored by the old party many years ago, that all the levels from the 80 to surface had been driven a considerable distance in this direction, and that the 20 and 50 were extended on the lode almost to the eastern boundary of the sett, and my impression is correct, of which I have no doubt, how can the part of the mine be unexplored ground.

And in reference to the junction of lodes, to which Capt. Southey attaches such importance, I understand that it has been already proved and seen in the 20 and 50, referred to above, at which points and in each direction around them both lodes are unproductive, which is a state not at all disappointing to a practical miner, seeing the junction is in clay-slate, and in the adjoining mine the north and south lode was productive only in a small run of elvan as spoken as it entered the slate-rock in depth, and at both ends it became barren, as Capt. Southey who says he often inspected the said mine must know. But whatever may be the opinion as to the cause of its productiveness or otherwise if the 20 and 50 fm. levels are open I believe Capt. Southey may see the effect of the junction if he will only examine these points, especially the latter; and as it is a deeply interesting and important matter to the shareholders who are paying heavy calls, I trust he will do so most carefully, and in your next issue in his usually candid and intelligent manner correct me if in error. I may add the writer has not rushed into print recklessly, for since issue of the agent's report he has consulted reliable and pa

tical miners, who thoroughly know the mine, and fully agree with the foregoing statement of— ONE DEEPLY INTERESTED.

## MINING IN CARDIGAN.

SIR,—I see from the letter of your North Wales Correspondent in last week's Journal that there was a falling off of some 1600 tons in the production of lead in Montgomeryshire last year, and it would be interesting if he could give some similar statistics regarding Cardiganshire, which, I understand, is the most productive county at present in the Principality, besides yielding a more valuable class of mineral, being highly impregnated with silver. We hear a great deal about Montgomeryshire on account of the Van Mine, which, no doubt, has proved a very rich property; but what about the Lisburne Mines in Cardiganshire, which have paid over 600*l.* a share in dividends, and the numerous other mines which have made this county famous for its great mineral wealth? Bwlch United is, I believe, again in the ascendant, and selling lead. This mine has in former years made enormous returns, and, I believe, can do so again. Frongoch made last month a very large return of lead and blende, and in the immediate future West Lisburne, on the same rich lode as the celebrated Lisburne, will fully justify the high anticipations of its great mineral wealth which there has been every reason to form concerning it, and which thoroughly good management is now developing. A LOOKER-ON.

## SOUTH WHEAL FRANCES.

SIR,—At the late meeting of the South Wheal Frances Company 100 guineas were presented to Capt. Abraham James, as a proof of the value they attached to his services, on his relinquishment of his post as manager. So far from doing that and begging him to stay I consider he should have been censured for the advice he gave to a shareholder. * * * He ought to have given a fair advice to the shareholder, by telling him what the prospects really were. If he had done that the gentleman, no doubt, would be a holder at the present time. I shall not regard Captain James as a man to his word until he gives the champagne dinner to the agents at Wheal Peevor, which he promised to give them if ever a dividend of profit were made in that mine. He has, I believe, failed to fulfil that promise up to this date.—*Nov.* 9. MINER.

## GUNNISLAKE (CLITTERS).

SIR,—With reference to your Cornwall Correspondent's temperate criticism, in last week's Journal, on the proceedings at the adventurers' meeting on the 2nd inst., I trust you will allow me to make a few remarks. No doubt merchants on the committee supplying the greater part of the materials, &c., is a crying evil in this and other mines; but if your Correspondent had been at the meeting he would have found that this evil is intensified in our mine by one of the committee being also a leading official on the mine, and is, moreover, the auditor. The shareholders have, with varying patience, put up with this for years, but several of them are now determined to put an end to this state of affairs in spite of packed meetings, and have this valuable mine worked for the benefit of the shareholders instead of for merchants and agents. What, after all, is a dividend of 1s. per share? Why, if this were declared at every four-monthly meeting it would only be about 3 per cent. on the shares; and this trifle, after getting nothing for four years in a mine of such splendid capabilities and large reserves. I was not present at the last meeting, but at the previous meeting, out of 730*l.* for merchants' bills, about 700*l.* was supplied by the committee. A SHAREHOLDER.

*Nov.* 9.

## THE MORAY FIRTH MINE.

SIR,—Having spent a week in examining this property, which is situated at Lossiemouth, about six miles from Elgin, in the North of Scotland, I beg to forward you a few remarks upon it, as being the most wonderful deposit of mineral at surface I ever beheld. The lode, which is from 30 to 40 ft. wide, and an exceedingly rich course of lead ore for all this width, runs a few degress to the north of east, and throughout the entire length of the grant, nearly one mile long. On each side of the vein, for a distance of more than 100 feet, the surface is filled with rocks and boulders of lead ore, in a matrix consisting of quartz, oxide of iron, and silex. There is no doubt on my mind that all the surface deposit has been upthrown from an immense body of lead ore below, and this will be soon proved, as there is a cross-cut now being put out from the bottom of the engine-shaft at some depth from surface, which in less than a month will tap this course of lead ore, and pass through it. The property has been recently purchased by the Moray Firth Mining Company, who have erected a most splendid field of machinery for working the mine on a great scale, the machinery for crushing and dressing being of the best description I have ever witnessed. They will no doubt reap a rich reward for the pluck and the great abilities they have displayed in so far opening out what appears to me is likely soon to become the greatest lead-producing mine in the kingdom. As the report I have prepared for their manager may find its way into your widely circulated columns, I must for the present content myself with this very brief description of it. ABSALOM FRANCIS.

*Aberystwith, Nov.* 1.

[For remainder of Original Correspondence see this day's Journal.]

MINING IN THE ISLE OF MAN.—We are glad to report an excellent account of the Langness Copper Mine, in the south of the Isle of Man. This mine, which is situated on an extensive sett, enclosing the whole promontory of Langness, has been worked and developed by a small private company of local gentlemen, who through good and evil report have stuck courageously to their property, assured of its value and ultimate success. About three years ago they tried to form a limited liability company to work the mine properly, but being badly advised they made too big a thing of it, and returned the application money, with 5 per cent. added. They have always had excellent prospects, having started with ore showing up to surface in each vein as thick as 20 in., and in the other 10 in., the ore being a rich sulphuret, assaying an average of over 20 per cent. of pure copper. After their failure to float they had hard times, and what was worse they had bad advice, and after sinking a new shaft of very large dimensions to a depth of 40 fathoms, and driving out to intersept the lodes some 30 fathoms, besides driving north and south at various angles on the supposed lodes, they discovered the lode had been passed by their manager, and scores of fathoms of ground had been worked underneath the lode away from it altogether. As soon as this was found out they subscribed a fresh call for their "last chance." As soon as the mine was opened again it was found that their late manager had left the discoveries he had made in the upper levels undeveloped, and, of course, attention was paid at once to these. A nice rib of ore was found to be making down from the 12 fm. level to a depth of 25 fathoms, and cropped up from 4 to 5 in. thick at the sole of the 12 fm. level, some 4 fathoms north. Last week a short driving was made at a depth of 16 fathoms on the lode, and a nice rib of ore very soon appeared both rising and making down, and making direct for the ore found north. A trial cross-cut was commenced in the 40 also, as the adventurers were informed that the driving there had been too much to the westward, the rider, a sort of black elvan, which accompanied the ore in the higher levels, not being seen. At the first hole a heavy feed of water was cut, and in a few days something good is looked for there. All this has happened within the past week, and the little company, so long and so severely tried, are in good hopes that at the "long lost," as the Manx people say, they have found what they have always felt was there. Notwithstanding their excellent prospects and their valuable discoveries, the company is not going to make the same mistake they did before. Their chief object is to get the mine worked properly, and they talk of disposing of the property for what they have spent on it, taking out every penny in shares, with the exception of a little ready cash to pay some yet outstanding liabilities. They have already some splendid ore ready dressed for the market, and with a little capital, and the discoveries just made holding, they can make paying work at once. We learn that the miners have offered to take the ground on tribute at once. Should this be the case a very small capital indeed would be required, and we should be surprised if such a good property goes long a begging.

## GEOLOGICAL SOCIETY OF LONDON.

NOVEMBER 3—ROBERT ETHERIDGE, F.R.S. (President), in the chair.

Bernard Barham Woodward, Stowe-road, Shepherd's Bush, was elected a Fellow of the Society.——William Heward Bell, Hungerford; William Jackson, Vernon Terrace Schools, Northampton; Peregrine Propert Lewis, M.A., L.L.M., Kensington Gardens-square; William Libbey, M.A., D.Sc., Princeton College, Princeton, New Jersey, U.S.A.; David Morgan Llewellin, Bryn Gomer, near Pontypool, Monmouthshire; John Marshall, Sowerby Bridge, near Halifax; Cyril Parkinson, Rock Cottage, Ventnor, Isle of Wight, and Farnfield, Southwell, Notts; Cornelius McLeod Percy, Standish, Wigan; Thomas John Robinson, Longton, Stoke-on-Trent; Rev. Alfred Rose, M.A., Emmanuel College, Cambridge; Beeby Thompson, F.C.S., Abington-street, Northampton; and Stuart Crawford Wardell, Doe Hill House, Alfreton, Derbyshire, were proposed as Fellows of the Society.——Samuel Kinns, Ph.D., F.R.A.S., Highbury New Park College; and Prof. Joseph Henry Tompson, the Auckland College, Auckland, New Zealand, will be balloted for as Fellows of the Society.

The following communications were read:—

1.—"On the Serpentine and Associated Rocks of Anglesey, with a Note on the so-called Serpentine of Porthdinlleyn (Carnarvonshire)," by Prof. T. G. Bonney, M.A., F.R.S., Sec. G.S.

2.—"Note on the Ocurrence of Remains of Recent Plants in Brown Iron Ore," by J. Arthur Phillips, F.G.S.

3.—"Notes on the Locality of some Fossils found in the Carboniferous Rocks at T'ang Shan, situated in a N.N.E. direction, about 120 miles from Tientsin, in the province of Chih Li, China," by James W. Carrall, F.G.S., with a note by Wm. Carruthers, F.R.S., F.G.S.

On Wednesday, the following communications will be read:—1. "On abnormal geological Deposits in the Bristol District," by Charles Moore, F.G.S.—2. "Interglacial Deposits of West Cumberland and North Lancashire," by J. B. Kendall, F.G.S.

## STEEL-MAKING.

At the Institution of Civil Engineers on Tuesday (Mr. W. H. Barlow, F.R.S., President, in the chair) the paper read was on "Machinery for Steel-making by the Bessemer and the Siemens Processes," by Mr. Benjamin Walker, M. Inst. C.E. It was stated that much had been done to render easy the manipulation of steel in the molten state, as well as in the solid but heated state. Hydraulic machinery played an important part in this operation. So extensive was the use of water pressure and so gigantic were the machines worked by this power, that it had become indispensible that the water employed as the source of pressure should be used economically. To attain the former condition the boilers must be of first-class material and workmanship, and be worked at pressures of 80 lbs. to 90 lbs. per square inch. The most advantageous hydraulic pressure was from 600 lbs. to 750 lbs. per square inch, and the engines for pressing the water should be of the compound type, highly expansive, and fitted with surface condensers. Large accumulators were necessary, and where the distances were considerable there should be several accumulators. The engines should be kept going continuously. The working was more economical at a piston speed of from 150 to 180 ft. per minute than at a lower speed. The valves and water-ways, especially for the inlet, should be large, the valves having but little lift. Cup-leathers and packing not easily accessible should be avoided, plain rams being preferable to buckets. The engines for pumping at high pressures should be compound, because the expansion was, to a great extent, beyond the control of the workman; simple piston or slide-valves could be employed, and elaborate gear avoided; the cooling effect was less in the compound than in the simple engine, and the compound had proved the more economical.

The author then described a pair of compound pumping engines of 300 indicated horse-power at the pumps. The high-pressure cylinder was 30 in. in diameter, the low-pressure cylinder 50 in., the stroke of each being 30 in. To the piston-rod of each cylinder was coupled a double-acting pump, the larger ram of which was 9 in. in diameter, and the smaller 6½ in. The action of the pump was similar to the ram-and-bucket pump, but ordinary packing was available. The engines were fitted with a surface condenser, air, circulating, and boiler pumps. The circulating pump drove water through the condenser tubes to the overhead tank for the supply of the force-pumps. The author had adopted the circular slide-bar, as it combined lightness with strength and cheapness. The cylinders were steam-jacketed, and the valves and pistons were similar to those of a first-class marine engine. Provision was made for rendering the engines automatic by letting boiler-steam at a reduced pressure into the low-pressure cylinder, and by an arrangement in connection with the accumulator, shutting this off when the engines had been set in motion. The author's firm had recently made for the East and West India Docks Company two pairs of compound surface-condensing pumping-engines for accumulator pressure of 150 indicated horse-power at the pumps. The boilers were of the Lancashire type, capable of being worked at a pressure of 75 lbs. per square inch. The engines had two high-pressure cylinders, each 20½ in. in diameter, and two low-pressure cylinders, each 32 in. in diameter, cast together and mounted on one bed plate, but independent. They were fitted for surface condensation. The mean result of a large number of diagrams showed a consumption of coal of 2¼ lbs. per indicated horse-power per hour. The large amount of water formerly necessary to feed the boilers was now almost entirely dispensed with; only the small quantity required to make up for loss at the head box and gland of the boiler pump having to be supplied. The high-pressure engines in the same house had been made surface-condensing by a separate engine; only one-third of the boiler power formerly needed was now required, and only one-third of the coal. The author had collected a large number of indicator diagrams from non-condensing pumping-engines working accumulators, and found that the average amount of water evaporated per indicated horse-power per hour was 35 lbs.; whereas in the compound highly expansive surface-condensing pumping-engines only 12 lbs. per indicated horse-power per hour of water were required to be evaporated.

The cost of producing 1000 cubic feet of water at a pressure of 700 lbs. per square inch, in the case of the usual plant at Leeds, was for the ordinary high-pressure non-condensing non-expansive accumulator pumping-engine about 6s. 7d., and for the economical highly-expansive surface-condensing engine 4s. 3d.

The paper then described an economical hydraulic engine, for hauling heavy weights at the author's works in Leeds, in which two small rams, half the area of a larger one, were always in communication with the accumulator, the larger being brought into communication with it alternately by a slide valve. The cranks being at right angles, and a hydraulic valve requiring neither lap nor lead, the crosshead of one ram was arranged to move the valve of the other. The author had made a large number of capstan engines with three cylinders, and had come to the conclusion that the double-acting engine, with cranks at right angles, had many advantages over the three-cylinder engine. It occupied little room, the connecting rods were long, the rams well guided, the valves and gear simple, and the whole was readily accessible, not requiring a foundation when used as a capstan for hauling. As a double-power engine, to exert a strain of 5 tons at 70 ft. per minute, the author had employed instead of a double crank a three-throw with six rams, three and three, and with forked connecting rods. The valve for admitting the water had double ports, and the arrangement was such that water could be admitted to either three or six rams. Engines of this class were in operation for hauling ships at the eastern extension of the East and West India Docks.

Illustrations were then given of an ingot crane, very economical in the consumption of water; of an 8-ton ingot crane in operation at Messrs. Bolckow, Vaughan, and Co.'s new steelworks at Eston; of a Siemens steel furnace, with the necessary hydraulic cranes, as in operation at the works of Messrs. John Brown and Company (Limited), Sheffield, and at the West Cumberland Iron and Steel Company's works at Workington; of a 10-ton Bessemer converter; of a centre crane; and finally, of a pair of vertical compound blowing engines, to be used in the process of making Bessemer steel.

## LECTURE ON BOILERS AND BOILER EXPLOSIONS.

On Saturday, before the members of the South Staffordshire Mill and Forge Managers' Association, the South Staffordshire Institute of Mining Engineers, and others interested in boilers, Mr. Marten (Stourbridge) exhibited his fine collection of exploded boilers in the Public Hall, Dudley. Mr. Harris, President of the first-named association, presided; and there were also present, among many others, Mr. Smith Casson, Mr. Collis, Mr. Henry Johnson, Mr. Joseph Morris, Mr. Thos. Brettell (Vice-President of the S.S.M.E.), Mr. R. Edwards (secretary M. and F.M.A.), Mr. W. Edwards, Mr. W. Farnworth, Mr. Thornton, Mr. Alex. Smith (secretary S.S.M.E.), Mr. Latham, and Mr. A. Chambers.

The Lecturer said he had but little to add to the lecture he gave in Dudley a month before, but he had a number of experiments to show that many popular theories for the explosion of boilers were untrue. Mr. Marten then heated a plate red-hot at one end and black-hot at the other. When he poured cold water on the red-hot end it formed globular forms, and moved rapidly about, but it did not produce steam until it was allowed to roll down to the black-hot end, where it quickly evaporated in a small puff of steam. This, he said, showed how difficult it was to get such a state of things in a boiler, and how difficult it was to get water in that condition. Mr. Marten then showed how pure water, when set to boil, would suddenly become perfectly still, and then boil by sudden leaps. He said boilers that were very still might be disturbed by sudden starts like the start of the engine attached to them, and thus get up an extra pressure of steam just on the moment. Mr. Marten then showed the decomposition of steam by making a jet of steam pass through iron filings, and lighting the product at the end of the pipe containing the filings. He did this, he said, to show that when boilers exploded people said there was some kind of mysterous gas which had greater force than gunpowder. Prof. Airey calculated that the eruptive power of water heated to 60 lb. pressure, was 1 cubic foot of water to 1 lb. of gunpowder. In answer to a question, Mr. Marten said it was the absence of foreign matter in the water which caused it to be still just before boiling point. The lecturer then pointed out the expansive force of steam, and showed a model of a boiler about the size of his thumb. Over this was a netting as large as a man's hat. He explained that the boiler would hold a force which would expand as large as the hat. This would account for the damage done by the boiler in exploding; the surrounding air would have to be packed back to allow for the expansion, and in being forced back walls, roofs, and other surroundings would be forced outward. Then, when the expansion ceased, the air would rush back to its place, bringing with it the debris which the expansion had disturbed. Thus it was that many of the things found an exploded boiler were apparently unmoved. (Applause.) In reply to a question, Mr. Marten said that when the iron filings had absorbed as much oxygen as possible only steam would pass through the pipe, and the light would be extinguished. An experiment on collapse followed, and it was shown that a canister filled with boiling water and steam suddenly plunged into cold water collapsed in an extraordinary manner. Mr. Marten deduced from this, care in allowing boilers to cool gradually. Even Cornish boilers had been known to suffer from that cause. After these experiments the Lecturer said they showed much, but the great secret to prevent boiler explosions was to see that all repairs were thoroughly well done, and that the material should never grow so weak as not to stand the ordinary pressure. (Applause, and a laugh.) Experiments to show the cause of "priming" were then given, and after some remarks on circulation in boilers, Mr. Marten remarked that in large establishments were there were many boilers one might be used to purify the water for the others by leaving the "scale" of the water in it. (Hear, hear.)

At this point, and whilst an experiment was being prepared, Mr. Rupert Smith gave some figures on mechanical stoking, which had been conducted by Mr. Smith-Casson, at Lord Dudley's Round Oak Works. These figures were strongly in favour of mechanical stoking over the shovel system. The mechanical system, with a smaller area of fire-grate, got up steam quicker and more of it, made less clinker, and still less smoke—in fact, the smoke was *nil*. In conclusion, Mr. Smith said he hoped shortly to give an exhaustive paper on the subject.—Mr. Marten then exhibited a plug with a soft metal interior, to prevent boilers from exploding when there was a shortness of water. When this latter become a source of danger the soft metal melted, and the water put out the fire under the boiler. He also exhibited a long tube, popular on the Continent. This was placed in the boiler, and the heat melted the soft metal plug in the tube, allowed the water to escape on to the fire, and the steam rushing still upward caused a whistle at the top of the tube to give a loud alarm. The lecture concluded with an experiment to show how steam could generate electricity. Mr. Marten said an engine-driver was once terribly frightened to find that whenever he was on his engine on a certain turn-table he experienced an electric shock, and that his engine would, when touched, give out sparks. The incident came to the knowledge of Sir W. Armstrong, then a young man, and he investigated it. At that time everyone thought the cause of boiler explosions had been discovered. But it was not fully explained until Faraday experimented. The experiment was then tried. A boiler was heated, and a jet of steam was forced through small holes in a piece of box-wood. The jets were caught on tin points, and conveyed by a conductor, from which Mr. Martin extracted, amid applause, some small flashes of electricity. The Lecturer concluded by saying that the secret of prevention was to see that the boiler never grew too weak to bear the ordinary pressure. (Applause.) Mr. Harris moved, Mr. Brettell seconded, and Messrs. J. Davis and Farnworh supported, a vote of thanks to Mr. Marten, who briefly replied.

EXPORTS OF COAL.—To Sept. 30 the excess of coal exports over those of 1879 for the same period was 2,000,000 tons, or equal to 2,500,000 tons for the whole year. The exports for the year will approach 21,054,202 tons; and if the present rate of increase continues, by 1890 the annual quantity sent abroad will be about 48,000,000.

THE ELECTRIC LIGHT.—In the current number of the Electrician there is a paper by Dr. Paget Higgs, in which it is urged that electric lighting is not yet so well understood by English as by American manufacturers. Some particulars are given respecting the cost of the electric light in industrial establishments which have a special value as having been obtained from consumers. The Brush system is the one in use. In addition to other places it is used at the Willimantic Cotton Mills, the largest concern of the kind in the Eastern States of the Union, and at the works of the New Jersey Steel and Iron Company, and of the Phœnix Iron Company of Pennsylvania. A typical intance is that of the Riverside Worsted Mills, where there are five machines supplying 80 lamps, some of which have now been in operation since the spring of last year. The consumers say that they have not had a moment's delay or any repairs on any of the machines or lamps in the interval. The actual cost of the light is given as follows:—

| | |
|---|---|
| Consumption of carbons per hour .....Cents | 89 |
| Power used for machines ..... | 65 |
| Interest on cost of machines, &c. ($1500) ..... | 90 |
| Attendance, oil, wear and tear, &c..... | 36 |
| Total cost an hour (8s. 10d. or) ..... | $2·20 |

Five hundred and seventy-eight gas burners would be lighted were the electric lights stopped. Estimating these burners at 6 ft. per hour, there would be 3468 cubic feet of gas per hour burnt; and as gas costs in America $2 (or 8s.) per 1000 ft., the cost with gas would be $6·93 c. (27s. 10½d.) per hour, with a vastly inferior light. The source from which the power is obtained is not stated, and it must also be remembered that gas costs less here than in the United States. The difference in the latter item would evidently considerably reduce the advantage of the electric light in regard to cost. Of course, there may also be some special advantage or disadvantge in regard to the source of the power in the instance quoted. On the other hand, the

special advantages of the light, and noticeably the fact that the comfort of the operatives is not disturbed by the heightening of the temperature of the rooms, as when gas is used, must be taken into account,

## REPORT FROM CORNWALL.

*Nov.* 11.—There seems to be a very natural, and we may hope also a well-founded, idea that with Consols at par there ought to be a fair chance of the investment of more capital in enterprises of a more speculative, and at the same time of a more promishing, character. The "newest simplicity of the 3 per cents." is all very well in its way, but to our thinking the simplicity is rather on the side of those who buy Consols at the present high rates, with the perfect certainty that another generation will elapse, when the tide overturns, ere they will see their full money back again. In the sense of the realisation of capital it certainly is not safe, though of course nothing can be safer than the dividend. There is plenty of room for the investment of additional capital in mining enterprise alike in Cornwall and in Devon. Many a good mine has come to grief in waiting a little, and just at the pinch which so often precedes success; and many a mine has suffered heavily for floating bankers' balances, which a little ready cash would have spared. Want of capital in working not less than for the starting of new concerns has long been an acknowledged want of the district, and now that money is so plentiful and the trade has so evidently turned in favour of the home production of metals, is it at all too much to expect that some of the spare capital will find its way in this direction?

There are still current very diverse rumours with regard to the probability of an amalgamation of South Frances and West Basset. On one hand it is stated to be impossible, on the other not only certain but easy. While it is idle to disguise the fact that there are difficulties in the way—but not more serious than half a dozen men of business in earnest could easily surmount—we still adhere to our belief that the amalgamation will be carried out, and that the amalgamation will be a matter of direct and great mutual benefit to the shareholders in the consolidated concern. It would be idle to comment further while the question is in the hands of the committee.

The Royal Geological Society of Cornwall has held its annual meeting at Penzance, under the presidency of Mr. A. Pendarves Vivian, M.P., when the reports presented shows that this, the oldest of the provincial geological associations, was in full activity and doing good work. The address of the president dwelt chiefly with the geology of the Welsh coal districts. Mr. Frecheville, the new Inspector of Mines, succeeds Dr. Foster as curator, the Earl of Mount Edgcumbe becomes one of the Vice-presidents. The papers read were:—Mr. Collins, F.G.S., "On the Supposed Serpentine in the Parish of Breage," and "Stanniferous Deerhorns;" Mr. Peach, A.L.S., "On Fossils from the Rocks of Cornwall;" Mr. Ussher, F.G.S., "On Pleistocene Rocks on the Coast from Plymouth to Looe;" Mr. W. A. Taylor, "On some New Pyrological Apparatus:" Mr. R. N. Worth, F.G.S., "On the Geology of the North-east part of Cornwall;" and by Mr. Batten, "On the Niana Tal."

The last number of the Mineralogical Journal contains a second paper by Mr. J. H. Collins, F.G.S., "On some Cornish Tinstones and Capels," admirably illustrated, and characterised throughout by the closest inquiry and nicest care. Mr. Collins' investigation of this long neglected subject entitles him to the thanks of all interested in this most important department of our local mineralogy. The same number contains also a paper by Mr. Readwin, F.G.S., embodying a large number of additional facts in connection with his observations on mineral growth.

## TRADE OF THE TYNE AND WEAR.

*Nov.* 10.—There is not much that is new to report in connection with the Coal Trade, there has been a good supply of steamers and sailing vessels during the past few days, but the steam coal trade—that is, for best steam coal—is somewhat dull; there is also a good supply of second-class coal in the market. The home demand for small and manufacturing coal of all kinds has improved considerably, owing to the activity in the iron shipbuilding, and trades depending upon this trade. The gas coal trade continues very firm, and shipments are large. The demand for best Durham house coal improves, and recent advances in price are fully maintained. Coke is in greater demand for home consumption, in factories, &c., and as the demand for export and for the West Coast and the Midlands has not declined rates are very firm. As winter has set in early and severe in North-Eastern Europe this has some effect on the export trades, and it is not now expected that there will be any great rise in value during the present year, but it is considered probable that an important advance will occur early in the spring.

The iron shipbuilding trade continues to advance here, as is shown by the state of matters at most of the principal works of that kind in this district; most of them have abundance of work on hand for some time to come, and some find it necessary to extend and improve their establishments to enable them to keep pace with the increase of business. At Messrs. Redhead's works, South Shields, extensive alterations and improvements are in progress. At Mitchell's works, Wigham, Richardson, and Co., and indeed at most of the works, there is full employment. At Palmer's works, at Jarrow, the shipbuilding works are fully employed, and the other branches of this great establishment, where marine engines, boilers, &c., are manufactured, are so fully employed that the works in one branch are to be enlarged considerably very shortly. The Howden shipbuilding yard, also belonging to those works, but situated on the north side of the river, are to be re-opened immediately. As those works were closed in the dull times this is a gratifying sign of progress.

The iron trade has been rather quiet during the week. In October there was a net increase in makers' stocks of 15,218 tons, which brings the total stock in the district to 298,928 tons. The total make of pig-iron was larger than in any previous period, being 222,097 tons, but of this 46,216 tons were hematite, &c. Three furnaces have been taken off hematite in October and put on Cleveland iron. The furnaces in blast remain the same—118, and 48 out of blast. The finished iron branches are moderately healthy generally speaking, and higher rates are expected. Bars are 5*l.* 17s. 6d.; ship-plates, 6*l.* 15s. Pig-iron has slightly recovered, being about 39s. 6d. for No. 3. At Middlesborough, on Tuesday, there was a good feeling, many enquiries for iron, and a strong tone about the trade. The market closed at the rates quoted above, but there is a tendency to rise. Messrs. Connal's stocks have increased 2000 tons. The shipments of late have been satisfactory; last week the amounted to 17,500 tons. The Baltic deliveries are still very large. A good demand is expected from America for hematite. The local steel trade is good, the demand being chiefly for the home railways. Plate and angle mills are extremely busy. Foundries are only moderately employed. There is a good demand for railway wagons at present, the demand for locomotives and all land engines continues very flat in the North.

In connection with the Seaham Colliery explosion it will be recollected that at the adjourned inquest the subject of coal dust was discussed, and prior to the further adjournment of the inquest Mr. Etherley Jones, who represented the Durham Miners Union, put in a written application that experiments and analyses should be undertaken and directed by the Home Office with a view to elucida te this subject. The Home Secretary has, therefore, directed the analyses and experiments to be made. Samples of burnt dust found in the mine after the explosion are to be analysed with a view to an opinion whether such burnt dust is—1. The ash or product of dust burnt by an explosion of fire-damp.—2. Is the remains or product of dust which has itself been explosively burnt with or without fire-damp, whilst suspended in the air? Samples of unburnt dust are to be collected in the mine and analysed, and also subjected to experiments with a view to try—1. How far the presence of such dust suspended in the air or lying in the gallaries of the mine intensifies an explosion of fire-damp, or extends the area of the effect of such an explosion.—2. How far such coal dust in suspension in the air is capable of mischievous explosion—*e.g.*, by a shot, or by passing through a ventilating furnace—without the presence of gas.—3. What are the effects of a shot fired in a gallery (such as the air-ways of a colliery) in causing the disturbances and suspension in the air of such coal dust lying on the floor of timbers of the gallery.

Those queries are certainly very important, and their solution, if fully accomplished, will no doubt prove useful, and they may, possibly, throw some light not only on this particular case, but on the cause of explosions generally; but, while there is little doubt that the presence of large quantities of fine dust will intensify an explosion of gas, it is not probable that an explosion will originate from such a cause. In very dry mines fine dust accumulates in considerable quantities in the main roads, which are, of course, intakes—that is, ventilated by ingoing currents of air; but this dust is generally kept well down by frequently and copiously watering the roads. In the return air-ways there is comparatively little dust to be found. The main question, however, still is the discovery of the source from whence the gas which caused the explosion originated, and the means by which it was ignited. When those points are cleared up in any case there is ground for hope that discoveries have been made which will lead to the adoption of measures which will prevent the occurrence of such dreadful disasters in future.

At the Northern Institute of Mining and Mechanical Engineers meeting of members, on Saturday, there was a good attendance of members and others. Mr. G. C. Greenwell was in the chair. Mr. Bunning (the secretary) read the following resolution, which had been passed by the council:—"That in the opinion of the council of the North of England Institute of Mining and Mechanical Engineers it would be unadvisable and prejudicial to the College of Physical Science if the age of admission of students is reduced below 15 years, and that Mr. Boyd and Mr. Forster be asked to present this resolution to the council, and urge its adoption." Mr. Henry Richardson, of Backworth, read a description of a sinking set fitted with windbore projector, and suction regulator on a new principle. A paper was read by Mr. Edwin Gilpin, Inspector of Mines, "On the Gysum of Nova Scotia." The writer stated that he believed the gypsum deposits of Nova Scotia are the largest and most extensive in the world; and, what is very remarkable, the only deposits of this kind which have been discovered in measures of the carboniferous age.

## REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

*Nov.* 11.—Pig-iron sold rather better upon 'Change in Wolverhampton yesterday and in Birmingham to-day, but makers were not able to obtain higher prices. All-mine hot blast sorts were to be had at 2s. 6d. per ton less than the official 3*l.* 5s., but hematites, on the other hand, remained firm at 3*l.* 10s. Only little business was done in either description. Part mine pigs were 2*l.* 15s. per ton, and cinder pigs 1*l.* 17s. 6d. to 2*l.* The products of the Spring Vale furnaces were quoted 2*l.* for common and 3*l.* for best. Lincolnshire all-mine pigs were without business at 2*l.* 10s., delivered. A few sheet makers reported a resumption of the activity lately noticeable, and which had fallen off for a week or two. Galvanising singles were quoted at 7*l.* 10s. to 7*l.* 15s., and doubles at 8*l.* 10s. to 8*l.* 15s. The list bar houses are doing a shade more than previously. The coal trade is without appreciable alteration upon the week at the prices given in my last.

The legal arbitrator under the South Staffordshire Mines Drainage Acts, Mr. G. M. Dowdeswell, Q.C., made some important remarks a few days ago at a public Court of the Arbitrators in Wolverhampton, called to hear evidence on the proposal to make a draft mines drainage award for the Old Hill district. He said he was very much averse to allowing graduation, for if such a system were allowed to much extent in the Old Hill district it would, in depriving the Commissioners of a portion of their annual income, probably necessitate them borrowing money to carry on mines drainage works that were absolutely necessary. The outcome of such a policy in the Tipton district would if something was not done to remedy the existing state of things be, he feared, the ruin of the district. The arbitrators wished to provide the Old Hill committee with sufficient income to render unnecessary the putting into exercise the borrowing powers of the Act. Every farthing which the district borrowed was, in fact, a mortgage upon the property of every colliery owner in the district. The full rate required to be levied was 3d. per ton on fire-clay and limestone, and 6d. per ton on ironstone, coal, and slack. There were only two contested appeals, and both appellants secured a reduction in their rate.

The work of lowering M. Chaudron's patent iron tubbing into the No. 2 pit of the Cannock and Huntington Colliery has been commenced, and it is hoped that in three weeks the whole of the 430 ft. will be in position. The process of lowering the concrete between the tubs and the sides of the shafts will then be commenced, and after that the sinking of the shaft by the ordinary method will be continued down to the workable seam of coal. The deepest seam which has yet been proved is an 8 ft. seam at a depth of 532 ft., and below this it is believed that the deep Cannock Chase will be found. It is proposed to "tub" the No. 1 shaft also when those in No. 2 have been placed in position. M. Chastelain, the chief engineer to M. Chaudron, is superintending the operations.

## REPORT FROM DERBYSHIRE AND YORKSHIRE.

*Nov.* 11.—There has been very little change in the state of affairs in the lead mining districts of Derbyshire. The change in the weather, however, has been more favourable to mining operations at many places where the shafts are unprotected. The production has been well maintained, but many of the mines are either closed or getting little ore. At the ironworks business continues tolerably fair as far as pig-iron is concerned, as the output has been kept up to the average, whilst the demand is of a steady character, and not what can be termed really active. The mills engaged in the rolling of bars, and merchant iron generally, are not working to their full extent. Some of the foundries, however, are doing well, and there are some heavy orders placed for engines and machinery, as well as for pipes. At the steel rail works there has been no falling off in the activity which has prevailed for a considerable time past. The patent armour-plates of Mr. Wilson, of the works at Dronfield, are likely, it is said, to be adopted by the Admiralty, seeing that they have stood the tests at Portsmouth remarkably well, and perhaps better than most others. The question of the plates to be adopted for the Navy in the future is a most important one, but those made of steel for a facing with an iron back are those which must be used, and no better appears to have been turned out than those patented by Mr. Wilson.

There has been a marked improvement in the Coal Trade of late, and large quantities have been forwarded from the leading collieries in Derbyshire to the South. The business doing with London in particular has materially increased, as a proof of which it may be said that during last month no less than 25,000 tons were sent from Clay Cross alone within the radius of the City dues, and about 17,000 tons from Eckington. During October there was sent from ten of the Derbyshire collieries 131,600 tons to the Metropolis. Prices, as might be expected, have advanced for the house coal, but not so the extent that might have been expected, so that the rates now charged may be said to entail no loss, and leave but little profit. Steam coal is not in such good request as it has been, although there has been no falling off in the consumption for iron making purposes. Gas coal has gone off rather better of late, but there has been no improvement as regards engine fuel. At some of the mines the men have intimated that the time has arrived when there should be an advance of wages, but no decided action has been taken in the matter, for many of the miners now working full time are desirous of going on without interruption.

In Sheffield trade goes on improving, and there are now few branches in which the men are not fully employed. The make of raw iron is still large, whilst a good deal of hematite pig continues to be imported from other districts. Ship and boiler plates, as well as sheets and hoops, have been in fair request, and the output appears to be increasing. Makers of Bessemer continue busy, as the consumption, especially for rails and railway materials, is large, whilst prices are improving. The cutlery houses are now favourably off for work, good orders being in hand on American account; and transactions in the home market are more extensive than they have been. More business is also being done in razors, scissors, and similar hardware goods. The season for agricultural implements is over, so that this branch is now quiet. Skate makers are getting ready for the demands that are expected to be made upon their resources, and as scarcely any stocks were left over last season, there is now considerable activity on the part of the workmen. At some of the foundries there is a steady business being done, one firm in the district having a large contract in hand for gas-making plant.

In South Yorkshire the coal trade is much better than it has been for a long time, and the pits are working much better. The recent demand for an increase of wages on the part of the workmen appears to have been withdrawn until a more fitting season, when the price of coal is higher than it is at present. The run, of course, is upon house coal, but, strange to say, there has not been much difference in the tonnage sent to the Metropolis of late and that sent a month or two ago. This is caused by the rate charged by the Great Northern being so high as compared with that charged by the other lines from other districts, and the marked difference there is in the charge for coal going by sea and land. When coal has been taken from the Tyne to the Thames at 4s. per ton, the charge from South Yorkshire to London *via* the Great Northern has been 8s. 3d. per ton. The scheme of Mr. Thompson to take the coal to Boston and then ship it from Boston Deeps appears to be the only remedy for this state of things which has been so prejudicial to our colliery owners, who have an exceptionally fine field of coal, but which, owing to the railway rates, cannot be developed to anything like the extent it ought to be. That the value of railway property has greatly deteriorated we have had several notable examples; and lately a Derbyshire colliery was put up for sale when there was not a single offer for it.

## REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

*Nov.* 11.—As a good deal of mining interest centres in Shropshire just now, I will begin by expressing my satisfaction that the amalgamation of the mines to which I think I was the first to refer in these columns has been effected. The united production of the three mines ought to yield good profits. A new discovery of ore has just been made in the Perkins Beach Mine, which closely adjoins the Tankerville, some of the lodes of the latter passing through the property. What this mine wants, however, is a depth equal to its neighbour's, when, in all probability, the like results would follow. Another mining movement in Shropshire is the resuscitation of the South Roman Gravels; here it is, I believe, proposed to sink a new shaft upon the great Roman lode, as near as possible to the rich workings on this lode in the Roman Gravels, which are not, comparatively speaking, very distant. Singularly enough, no openings have been made by former companies upon that lode within this property.

It would be very interesting if some of the oldest mining inhabitants would contribute to the Journal notes of the history of mining in this county during the early years of the present century. Who will begin?

In Cardiganshire the discovery of lead ore at Bryn Dyfi Mine increases in importance. A run of ore ranging from 2 to 4 tons per fathom on an average has been driven on for about 10 fathoms, and the ore increases as the driving is carried westward. The owners of this mine are proving it energetically and effectively before erecting dressing machinery. The news from several of the mines in this county is of a cheering nature. All that is wanted is a little advance in the price of lead. Three fatal accidents have just occurred within the district from which I write. A man has been killed at the Dinorwic Slate Quarries by a fall of rock, another at the Hafod-y-Bwch Colliery, near Ruabon, by a fall of roof, and a third at the Minera Limeworks by the falling of a plank along which he was wheeling a barrow. A great improvement has taken place in the Coal Trade. Most of the collieries are now busy, and prices have gone up from 1s. to 2s. per ton. I am sorry, however, to have to record the blowing out of the last furnace at the New British Company's ironworks near Ruabon.

The Great Northern Railway Company have acquired the Stafford and Uttoxeter line. This is a line which, like the Wrexham, Mold, and Connah's Quay, and the Potteries, Shrewsbury, and North Wales lines, has suffered by being left a piece only of a more extensive project. If the links projected some years ago to connect the two first named and so form a new route from the North Midland counties to Liverpool, and those that were to connect the Stafford and Uttoxeter with the Potteries and North Wales line at Shrewsbury, with the extension of the latter *via* Llangynog to Bala could be made, the results would be satisfactory to the districts, and, as I think, to the railway owners. An important piece of the line from Rosebush to Fishguard in Pembrokeshire has been made, and in celebration of this difficult part of the undertaking the Hon. Mr. Owen entertained the contractors, engineers, and workmen, to supper at Maenclochog, last week, when mutual congratulations were given. This will be the first line to this south-west corner of Wales, to be followed, it is to be hoped, by the Whitland and Cardigan, and a coast line from Cardigan to Aberystwith.

## THE COAL AND IRON DEPOSITS OF VIRGINIA.

Amongst an interesting series of samples of minerals from America forwarded to Messrs. Bailey, Wilson, and Co. (United States Land Bureau), of Holborn Viaduct, are some excellent hematite iron ores from Virginia, which are well worth inspection, and which considering the great advantages possessed by that State in likewise enjoying an abundant supply of mineral fuel would, it is considered, remunerate English capitalists undertaking their development far better than many of the mining projects in the more Western States to which they have given their support. The ores in question are obtained from the neighbourhood of the James River, a district long familiar by name to the readers of the *Mining Journal*, although hitherto little, if anything, has been done towards developing it. It is understood that ore of equally good quality is found over a large district, but a short referenee to an elaborate report which has been made for the Birmingham Iron and Coal Company by Mr. A. L. Williams, the President, will suffice to explain the character of the deposits and the facilities for working, especially as the samples are not of such a size as to admit of any opinion as to the character of the deposits, although the quality leaves nothing to be desired. The Birmingham property is about six miles below Lynchburg, on the south bank of the James River, along which it extends for about six miles, with an average width of about 1½ mile. There are excellent facilities for transport, the James River and Kanawha Canal bordering the property for four miles, and the Atlantic, Mississippi, and Ohio Railroad passes through it for about one mile, cutting the southern outcrop of the ore belt; and when the Richmond and Alleghany Railroad, now in progress, is completed, there will be direct communication eastward with the tidewater at Richmond, and westward to the great coal and coke fields on the New River, in West Virginia. It need scarcely be mentioned that from Lynchburg there are four lines of railroad leading to all parts of the country.

The ore bearing formation is a series of ridges and hills running north-east and south-west, and consisting of alternations of quartzite, hydromica, talcose, and chlorite slates and limestones dipping from 10° to 45°. The numerous openings and cuts made during the past three years have developed four well defined ore belts—the Mount Athos, the Chestnut Mountain, the Red Ore, and the Pot Ore. Each of the Red Ore belt are extensive outcrops of limestone, which carry on their flanks a magnificent burden of rich brown hematites—these are locally designated the Pot Ore belt. The principal exhibition of specular and magnetic ores are in the quartzites and between the quartzites and the slates. In the Mount Athos belt six well defined veins have already been opened upon—two being specular, two magnetic and specular, one limonite, and one manganiferous. In the Chestnut Mountain belt seven well defined veins have been laid open. One of these is described as a very fine high-grade micaceous specular ore, upon which two sloping shafts have been sunk 90 feet and connected, proving the vein to be 12 ft. wide, in solid ore; one third of it will yield 65 per cent. metallic iron, and the remainder from 40 to 55 per cent. The analyses show these to be absolutely free from sulphur and remarkably low in phosphorus. The Red Ore belt is a series of red and brown hematite veins 2 ft. to 20 ft. thick alternating with slate having a breadth of from 300 to 600 ft. The red hematites in this belt are also low in phosphorus and free from sulphur, rendering them a good Bessemer or steel ore; they yield

from 40 to 60 per cent. of metallic iron. The Pot Ore belt is composed of two seams of brown hematite ore. One of these is 20 to 30 ft. wide of solid ore, yielding 50 per cent. of iron, slightly too high in phosphorus (0·11) for steel, but very low (0·032) in sulphur, and making a very soft tough iron. It appears that in Virginia the freehold, including minerals, of land scarcely less valuable than that of the Birmingham Company can be purchased at $30 (or 6*l.*) per acre, so that it is not surprising that the State is confidently referred to by those acquainted with it as offering great attractions to capitalssts.

## THE COAL FIELDS OF NATAL.

We have been favoured with the Natal Government Gazette, of Sept. 21, containing the preliminary report upon the coal fields and deposits of ironstone in the colony of Natal, by Mr. FRED. W. NORTH, M.E., F.G.S., Colonial Mining Engineer. He states that very valuable deposits of magnetic oxide of iron occur in many places, the value of which is, of course, enhanced when in the proximity of good coals for smelting it. It has been worked in former times by the natives; is highly magnetic; its average specific gravity is 3·254, and from the superior character of the ore cannot fail to yield a most excellent quality of cast-iron from the blast furnace; or it may be manipulated into blooms, and then hammered into splendid wrought-iron. He adds that if he be favoured with instructions he will make some experiments with it, and, having found a suitable flux within a reasonable distance, will reduce a few tons to metallic iron by means of a cupola.

Although Natal may not be very prolific in precious stones and metals, it appears to have a more solid foundation for industry and wealth in its deposits of coal and iron. It is a fortunate circumstance, he thinks, that so much of the land remains in the hands of the Crown, for when properly opened up by railway communication the mineral wealth contained in it must very materially add to the revenue of the colony. The coal about Mr. Still's farm is of good bituminous quality, and, knowing this, it will be well for the Government to hesitate before alienating a single acre of this land until every assurance has been obtained that the other coals near Newcastle or elsewhere are both abundant and of equal quality, because this land is now known to be of value, and for future locomotive purposes would be of the utmost importance if the other districts do not contain the same quality of fuel.

The coal produced at the Dundee and Coalfields farms is bituminous. The plains of bedding and lines of clearing are adapted to produce a fair proportion of large coal. Some parts of the seam are very glossy and jet black, and in other places the glossy appearance is changed to a dull compact cubical coal. The specific gravity of three average samples was 1·373. The bands of shale and parting in this seam have a tendency to mingle with the broken coals; but in some of the best English coal seams this same difficulty has to be grappled with, and the evil arising from the mixture of this interstratified matter with the fuel is only overcome by careful working in the mine, and by sorting on the surface, &c.

The coal burns freely, gives a long flame, with fumes of sulphur in the smoke, and leaves a dark grey ash. It is a very valuable fuel in its raw state, and he is of opinion that when the sulphur is driven off by converting it into coke it would for several reasons be more suitable for steam, and especially for locomotive purposes. Nevertheless, it is a very valuable coal for steam, house, gas, and manufacturing purposes, and he has no hesitation in declaring that it must ultimately become of the greatest importance to this colony, but can only be made of service by cheaper transport than that of the bullock wagon. The average price of conveyance by that means from here to Petermaritzburg is 3*l.* 10s. per ton, which, with the cost of mining the coal, will prevent it being used so long as the terminus of the line is at that city.

At the present time (Aug. 31) Mr. North is busily engaged in opening up the thickest coal he has ever found in South Africa. It is situated upon the farm adjoining to and to the west of Oumraki, and belongs to Mr. Meyer, who, we believe, recently bought it from the Government, and it is not named upon the map supplied to me from the Surveyor-General's office. This is a compound seam, which may be classed as a dry semi-bituminous coal, and is, therefore, more adapted for steam than any other purpose; but, as some of the bands or layers of this seam are more bituminous than others, and some, on the other hand, approach very nearly to the character of an anthracite, he feels sure that some portions of it will prove suitable for house and smiths' purposes. From its roof of grey false-bedded sandstone to its floor of black arenaceous shale it measures no less than 12 ft. 1 in. In thickness, and having only four small irregular partings of an aggregate thickness at the outcropof 10 in., there will not be more than that quantity of spoil, and certainly 11 ft. of clear coal. His previous work upon this seam was at Annandale, where it varied from 8 ft. to 9 ft. in thickness; and, having traced it to this point, he expected it to maintain its usual features. It gives him pleasure, however, to record the fact of the existence of this more important development of the seam, and he will devote himself to tracing it, so that he may ascertain the quantity, quality, cost of working, and the relative commercial value of it.

After further working upon this point of the outcrop he will be enabled to take out some good coal as a fair sample for analysis, and until then it is quite impossible to speak with positive accuracy upon its qualities for any purpose. He has little doubt, however, that it will when required prove a most valuable deposit. He presumed that if he is able to trace these deposits of latent fuel over a considetable area they will have great influence upon the important question of railway extension, and being fully aware of the enormous cost of such works he will only allow the most reliable information to guide him in his opinion, so that the evidence of his final report shall be of the most reliable and conclusive character. From Mr. North's preliminary report it is seen that he had at that time inspected enough coal to support a production of 500,000 tons per annum for 200 years, and without having made calculations as to further quantity he has inspected as much more since that date. From his examination of the strata to the Buffalo river, he does not think this main coal seam extends in an east and north-easterly direction to the boundary of Natal at that river, but he suspects that it reappears in the high ground to be seen from here upon the other side of it. Mr. North has not yet examined the country to the west and south-west of Oumraki, but expects to be able to trace the outcrop of the seam referred to in this report, and will continue his remarks upon his success or otherwise in his next review.

UTAH MINES.—Some interesting information concerning the Emma Last Chance, and some other Utah mines, in which English capitalists are concerned, is given by a special correspondent of the New York Engineering and Mining Journal. The new company by which the resuscitation will be effected is also to consolidate with or purchase the Illinois Tunnel and the three patented claims known as the Cincinnati, running diagonally across the Emma ground, which would give the Emma a large area of the famous hill, and which is doubtless very valuable property. In the mean time, developments in the Emma are pushing, and Superintendent Cullen expresses himself confident of opening a bonanza within a few months. The Joab Lawrence is making daily shipments of 15 tons of 125-oz. ore, and at the same time developing very handsome reserves. The City Rock, Antelope, and Prince of Wales, Maxfield, and Ophir continue their regular shipments. At Parley's Park the Lowell Mine, situated west of the McHenry Mine, has recently passed under the control of Walker Brothers, the owners of the famous Alice Mine, of Butte, Montana, and these gentlemen have begun operations to develope it. They have ordered pumps and hoisting machinery at a cost of $25,000, and let a contract to sink the main shaft 200 feet, together with 300 feet of levels. Prospecting in the other mines of this distriot goes forward with vigor. Deep mining in the Bingham district is proving successful. Developments in the Last Chance many months ago proved the permanency of the veins on the sonth side of the belt, and more recently the Lucky Boy has cut the vein by a tunnel 600 feet below the croppings, showing a strong body of high-grade ore. In the Queen Mine, situated on the same hill, a very fine vein of ore has been developed; and more recently, the Florence and Prince of Wales has been opened by a tunnel, showing a six-foot vein of high-grade ore. The excellence of this property is beyond question. It is a true fissure, and has been opened by prospect-shafts its entire length. The Live Pine, which has been put in fine shape this season, will begin shipping ore on Oct. 1, and thereafter will pay dividends. The Tiewaukee is still improving,

## THE COPPER TRADE.

Messrs. HENRY R. MERTON and Co. (Leadenhall-street, Nov. 1) issue the following Statistics of Copper:—

| | | |
|---|---|---|
| **Stocks in Europe:** | | |
| Chili ores and regulus, Liverpool and Swansea (equal to fine)..Tons | | 1,579 |
| Chili bars in Liverpool | | 21,685 |
| Chili bars in Swansea | | 9,141 |
| Chili ingots in Liverpool and Swansea | | 142 |
| Foreign copper (chiefly Australian) in London | | 6,134 |
| Foreign copper ,, ,, Landing | | 177 |
| Chili bars and ingots and barilla in Havre | | 5,976 |
| Other copper in Havre | | 985 |
| Stocks of copper contained in other foreign ore and Spanish Precipitate (fine) | | 2,046 |
| Afloat, and chartered from Chili to Europe (advised by mail): | | |
| Ore and regulus (equal to fine) | | 2,359 |
| Bars and ingots | | 5,970 |
| By cable, ores and regulus (fine) | | 300 |
| Bars and ingots | | 4,100 |
| Afloat from Australia (advised by mail): | | |
| Fine copper | | 532 |
| By cable: Fine copper | | 1,417 |
| Total | | 62,543 |

Price of bars, 61*l.*; Wallaroo, 72*l.*; English tough, 65*l.*

Messrs. HARRINGTON, HORAN, and Co. (Liverpool, Oct. 30):—Chili copper charters up to the 16th instant were 2300 tons fine, consisting of 1250 tons bars and 300 tons regulus for England and 750 tons bars Continental option. During the early part of the fortnight the price of good ordinary brands varied from 60*l.* 10s. up to 62*l.* per ton, according to prompt and brand; a reaction then set in, and nearly all the improvement was lost, market being quiet to-day at 60*l.* 15s. per ton for good ordinary brands on the spot. Sales of furnace material comprise 1400 tons Cape ore at 12s. 1½d. to 12s. 2d. per unit; 25 tons Peruvian ore at 12s.; 750 tons Bolivian ore at 12s. to 12s. 1½d.; 460 tons Bolivian regulus at 12s. 3d., 195 tons English precipitate at 12s. 1d. to 12s. 3d.; 819 tons Spanish precipitate at 12s., and 50 tons Rio Tinto at 12s. 4½d. per unit. Import of Chili copper during the past fortnight 547 tons fine, against 1995 tons fine same time last year; delivery, 1032 tons fine, against 2170 tons fine same time last year. Arrivals here during the fortnight of West Coast, S. A., produce; Ethel, from Caldera, 193 tons bars; Cordillera, from Guayacan, 24 tons ores, 180 tons bars, 85 tons ingots; Cordillera, from Tongoy, 139 tons bars. At Swansea, *nil*.

Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—

| | Ores. | Regulus. | Bars. | Ingots. | Barilla. |
|---|---|---|---|---|---|
| Liverpool | — | 395 | 21,685 | 142 | — |
| Swansea | — | 3112 | 9,141 | — | — |
| Total | — | 3507 | 30,826 | 142 | — |

Representing about 32,547 tons fine copper, against 33,032 tons Oct. 15; 28,600 tons Oct. 31, 1879; 23,444 tons Oct. 31, 1878; 18,747 tons Oct. 31, 1877. Stock of copper contained in other foreign ore and Spanish precipitate, 2046 tons fine, against 660 tons Oct. 31, 1879. Stock of Chili copper in Havre, 5775 tons fine, against 4288 tons Oct. 31, 1879. Stock of Coro Coro barilla in Havre 268 tons fine, against 125 tons Oct. 31, 1879. Stock of Chili copper afloat and chartered for to date, 13,500 tons fine, against 15,000 tons Oct. 31, 1879. Stock of foreign copper in London, chiefly Australian, 6000 tons fine against 5440 tons Oct. 31, 1879.

Messrs. RICKARDS and BUDD (London, Nov. 9) write:—Our market has been favourably influenced by the small charters for the last fortnight in October, and were consumption better we should, doubtless, have a substantial rise. Deliveries of Chili copper continue, however, to be disappointing, and until our large stocks are reduced we do not see what prospect there is of a permanent advance in values.

| | 1878. | 1879. | 1880. |
|---|---|---|---|
| EXPORTS—First ten months. | | | |
| English copper—wrought and unwrght...Tons | 25,522 | 27,730 | 26,248 |
| Foreign copper—unwrought | 10,885 | 15,406 | 13,317 |
| Yellow metal | 12,647 | 14,233 | 13,608 |
| Total | 49,054 | 57,369 | 53,173 |
| IMPORTS—First ten months. | | | |
| Copper in ores | 11,322 | 9,820 | 11,382 |
| Copper regulus and precipitate | 15,970 | 21,265 | 21,136 |
| Bars, cake, and ingots | 34,731 | 39,931 | 31,039 |
| In pyrites, estimated | 12,286 | 10,046 | 14,429 |
| Total | 74,309 | 80,062 | 77,986 |
| Total stocks in Europe and afloat, Nov. 1 | 51,558 | 56,318 | 62,543 |

Messrs. VIVIAN, YOUNGER, and BOND (Nov. 5) write—For the greater part of the past month Chili bars fluctuated between 60*l.* 5s. and 60*l.* 15s. Latterly there is some improvement, 61*l.* 5s. to 61*l.* 15s. being the quotation, though the demand for bars seems mainly speculative. The sales of precipitate ores continue large. The Indian demand has been very slack, but there is now more enquiry. The charters for October, advised by cablegram from Valparaiso, were 2300 tons for the first and 700 tons for the second fortnight.

According to the Board of Trade Returns for the United Kingdom the imports and exports of copper during the first nine months of the following years, estimated in fine, were as follows:—

| | 1880. | 1879. | 1878. |
|---|---|---|---|
| IMPORTS. | | | |
| Copper in ores and pyrites ..Tons | 24,948 | 19,457 | 22,991 |
| Regulus | 17,188 | 16,547 | 12,557 |
| Bars, &c. | 29,504 | 34,708 | 30,692 |
| Total | 71,640 | 70,712 | 66,240 |
| EXPORTS. | | | |
| Manufactured copper, &c. | 21,781 | 21,602 | 18,667 |
| Unmanufactured do. | 10,421 | 12,372 | 14,198 |
| Foreign do. | 11,961 | 13,006 | 9,440 |
| Total | 44,163 | 46,980 | 42,315 |

Messrs. HENRY ROGERS, SONS, and Co. (London, Nov. 4) write:—There was but a poor business in this metal last month, but the price of Chili slab was well maintained, and at the close of October had risen from 10s. to 15s. For English the demand is very slack, and tough, best, and manufactured are all offering far below the usual equivalent of raw material. A large demand is due from the East both for copper and yellow metal, but with a continually declining exchenge orders will naturally be withheld. The statistical position of copper does not improve; the nine months' imports show an increase, and the exports a decrease, the falling off of the latter being principally to the East. The spot stock, however, at the close of the month showed a slight decline, and that afloat and chartered nearly 1000 tons. The Chili charters and shipments are decidedly decreasing, as compared with last year, and will probably be 12,000 tons less in 1880, but the increase of precipitate from Spain will bring the total imports very much up to what they were in 1879. We subjoin our usual monthly statistics. The imports of copper into England for the first nine months of the following years were:—1876, 59,720 tons; 1877, 69,411; 1878, 66,131; 1879, 70,692; 1880, 71,624 tons. The exports for the same periods were:—1876, 37,746 tons; 1877, 37,106; 1878, 42,313; 1879, 46,980; 1880, 44,163 tons. The position from Nov. 1, 1879, to Nov. 1, 1880, was as follows:—

| | Price. | Stock on hand. | Stock, including afloat and chartered. Advised by mail only. |
|---|---|---|---|
| 1879—November 1 ... | £66 0 0 | .....Tons 38,716 | .....Tons 49,955 |
| December 1 ... | 66 10 0 | ..... 41,115 | ..... 53,165 |
| 1880—January 1 ..... | 66 0 0 | ..... 42,159 | ..... 54,119 |
| February 1 ... | 73 10 0 | ..... 37,997 | ..... 51,809 |
| March 1 ..... | 71 0 0 | ..... 38,000 | ..... 50,266 |
| April 1 ..... | 65 10 0 | ..... 42,065 | ..... 54,944 |
| May 1 ..... | 60 0 0 | ..... 42,744 | ..... 54,669 |
| June 1 ..... | 56 0 0 | ..... 42,078 | ..... 54,608 |
| July 1 ..... | 60 0 0 | ..... 45,445 | ..... 55,570 |
| August 1 ..... | 61 0 0 | ..... 44,390 | ..... 56,042 |
| September 1 ... | 61 5 0 | ..... 43,876 | ..... 55,529 |
| October 1 ..... | 60 5 0 | ..... 46,055 | ..... 54,679 |
| November 1 ... | 61 0 0 | ..... 45,804 | ..... 53,879 |

And the comparative positions at the same date of the past four years with the present:—

| | Price. | Stock. | Stock, including afloat and chartered. Advised by mail only. |
|---|---|---|---|
| 1876—November 1 ... | £76 10 0 | .....Tons 25,740 | .....Tons 33,476 |
| 1877—November 1 ... | 65 10 0 | ..... 31,454 | ..... 36,177 |
| 1878—November 1 ... | 57 0 0 | ..... 39,712 | ..... 47,567 |
| 1879—November 1 ... | 66 0 0 | ..... 38,716 | ..... 49,955 |
| 1880—November 1 ... | 61 0 0 | ..... 45,804 | ..... 53,879 |

The charters to Oct. 31, 1880, were 34,900 tons, against 44,300 tons in 1879.

Messrs. FRENCH and SMITH (London, Nov. 4) write:—Stocks in importers and speculators' hands are strongly held, and values show a tendency to stiffen. Charters from the West Coast were advised for the first half of October 2300 tons; second ditto, 700 tons. We quote Chili bars, 61*l.* 5s.; Wallaroo, 72*l.*; Burra, 69*l.* 10s.; tough, 65*l.*; manufactured, 70*l.*; ore and regulus, 12s. to 12s. 6d. per unit. The imports and exports, January to September (nine months), were, by Board of Trade Returns:—

| | 1880. | 1879. | 1878. |
|---|---|---|---|
| IMPORTS. | | | |
| Ore ..Tons | 78,080 | 68,029 | 77,830 |
| Regulus | 34,376 | 33,093 | 25,115 |
| Copper | 29,504 | 34,708 | 33,692 |
| EXPORTS. | | | |
| Foreign raw | 11,961 | 13,006 | 9,440 |
| English raw | 10,421 | 12,722 | 14,197 |
| Manufactured, including yellow metal and brass | 24,529 | 24,432 | 20,128 |

Messrs. VIVIAN, BOND, and WATSON (Oct. 30) state: The Chili charters for the first half of this month were advised by cable on the 18th inst. as 1250 tons of bars ond ingots, and 300 tons of ores and regulus for England, and 750 tons of fine for the Continent: total 2300 tons. The market opened dull g.o.b.'s spot being sold at 60*l.* 10s., but afterwards improved, and with a good demand the price advanced to 61*l.* 5s. to 62*l.*, according to brand and position. The advance has not, however, been maintained, and we close quiet with g.o.b.'s at 61*l.* sellers, buyers near. In furnace material the following sales are reported by private treaty:—About 800 tons of Spanish precipitate at 12s., 150 tons of English at 12s. 1d. to 12s. 3d., and 50 tons of Rio Tinto at 12s. 4½d., two cargoes of Cape ore and 345 tons of Bolivian at 12s. 1½d. to 12s. 2d., 24 tons of Peruvian ore at 12s., and 330 tons of Mexican, to arrive here, at 12s. 3d. per unit. A cargo of Bolivian ore and regulus to arrive, sold at 12s. and 12s. 3d. respectively. There has been no Swansea sale during the past fortnight.

Messrs. RICHARDSON and Co., Nov. 1, write:—The stocks of Chili copper produce remaining unsold at Swansea on Oct. 1 were—ore, 730 tons (since sold); regulus, 3112 tons; copper, 9141 tons. There have been no arrivals of Chilian since. The present stocks are—Cape ore, 500 tons; New Quebrada, 1772 tons; Newfoundland—Betts Cove, 8196 tons; Italian, 511 tons; Spanish, 517 tons; Australian, 255 tons; British, 620; total unsold at Swansea—ore, 12,371 tons; regulus, 3112 tons; copper, 9141 tons, representing about 11,000 tons fine copper. In private sales the following are the most important that have taken place of ores lying there:—On the 4th, 508 tons of Cape ore at 12s.; 7th, 200 tons Cape ore at 12s.; 10th 220 tons of Cueva de la Mora precipitate at 11s. 9d. to 12s.; and about 80 tons of Aljustrel at 11s. 6d. to 12s.; 20th, 730 tons Cape ore at 12s. 1½d.; 22nd, 100 tons Cape 12s. 3d.; 26th, 360 tons New Quebrada at 12s.; the remaining moiety of a cargo of Bolivian ore at 12s. 1½d.; and a cargo of Bolivian produce to arrive at 12s. and 12s. 3d.; for ore and regulus respectively. The only charters advised since our last have been 1250 tons in bars and ingots and 300 tons in furnace material for England, and 750 tons by distant sailing ships to order, France or England.

## THE TIN TRADE.

Messrs. STRAUSS and Co. (London, Oct. 30) issue the following Statistics of Tin:—

| | Oct. 31, 1880. | Oct. 31, 1879. | Oct. 31, 1878. |
|---|---|---|---|
| Straits and Australian, spot.....Tons | 6,647 | 8,477 | 9,064 |
| ,, ,, landing | 420 | 40 | 235 |
| Straits, afloat | 400 | 40 | 260 |
| Australian afloat | 1,606 | 1,691 | 1,811 |
| Banca, on warrants | 1,133 | 1,297 | 1,240 |
| Billiton, spot | 1,997 | 2,088 | 1,695 |
| ,, afloat | 1,260 | 580 | 950 |
| Australian tin in Holland | — | 205 | 386 |
| Total | 13,463 | 14,418 | 15,641 |
| Prices of Straits | £89 00 | £95 0 | £60 0 |
| Deliveries during month in London | 1,041 | 1,657 | 1,323 |
| ,, ,, ,, Holland | 1,264 | 1,122 | 626 |
| Total | 2,305 | 2,779 | 1,949 |

Shipments during the month from Straits..... 350 tons.
,, ,, Australia..... 850 ,,

| | During first ten months, 1880. | 1879. |
|---|---|---|
| Shipments from Straits to London .....Tons | 1,680 | 2,855 |
| Shipments from Australia to London | 6,248 | 5,756 |
| Deliveries of tin in London | 10,750 | 11,281 |
| Deliveries of tin in London and Holland | 17,090 | 18,249 |

Banca in Trading Company's hands and afloat, 1856 tons.

Messrs. EBELING and HAVELAAR (Rotterdam, Nov. 1) state:—Our Tin Market has shown considerable strength during the greater part of the past month. Prices at the close show an advance of fully 4 fl. over those ruling at the end of September. The favourable statistical position of the article has brought a good many speculators into the market, while consumption has been operating freely at the ruling rates. With a good and general demand for Banca prices advanced from 50 fl. to 53½ fl., from which we declined to 52½ fl. With renewed activity during the last few days the price has since risen to 54 fl., at which there are now buyers, holders asking 54½ fl. Contracts for delivery ex Nov. sale changed hands from 50½ fl. to 54½ fl. This year's last sale will be held towards the end of this month. Billiton has been in active demand, both spot parcels and forward deliveries, the latter drawing the special attention of speculators. After advancing from 49½ fl. to 53 fl., the price declined to 52 fl., when an increased enquiry set in and with large transactions we advanced to 53½ fl.; sellers now ask 54 fl. 13,000 peculs Billiton offered in public sale at Batavia, on Oct. 12, fetched the average price of 88¾ fl., costing to sell here about 52 fl. by steamer. Next sale comprising the same quantity will be held on Dec. 14.

The position of Banca tin in Holland on Oct. 30, according to the official Returns of the Dutch Trading Company, was—

| | 1880. | 1879. | 1878. |
|---|---|---|---|
| Import in October .....Slabs | 2,735 | 2,341 | 4,336 |
| Total ten months | 108,785 | 135,647 | 110,479 |
| Deliveries in October | 16,874 | 16,989 | 13,492 |
| Total ten months | 103,418 | 121,106 | 100,788 |
| Stock second hand | 36,253 | 41,500 | 39,671 |
| Unsold Stock | 53,081 | 45,459 | 35,584 |
| Total stock | 89,334 | 86,959 | 75,255 |
| Afloat .....Peculs | 3,170 | 9,550 | 8,200 |
| Statement of Billiton:— | | | |
| Import in October .....Slabs | 16,600 | 16,412 | 7,300 |
| Total ten months | 109,321 | 111,948 | 93,023 |
| Deliveries in October | 20,648 | 23,808 | 7,362 |
| Total ten months | 102,649 | 98,740 | 77,969 |
| Stock | 63,926 | 66,820 | 53,564 |
| Afloat .....Peculs | 15,000 | 18,000 | 19,000 |
| Quotation, Oct. 30—Banca | 54½ fl. | 54 fl. | 38 fl. |
| Billiton | 54 fl. | 53½ fl. | 37 fl. |

These combined returns of Banca and Billiton for 1880, compared with those for 1879, exhibit—An increase of the import for October of 18 tons; a decrease of the import for the ten months of 984 tons; a decrease of the deliveries for October of 102 tons; a decrease of the deliveries for the ten months of 274 tons; a decrease of the stock second-hand of 254 tons; an increase of the unsold stock of 236 tons; a decrease of the total stock of 16 tons; an advance of the quotation of Banca of 16s. per ton.

The Government returns for the month of August are as follows:—

EXPORT OF TIN FROM HOLLAND.

| | For August. 1880. | 1879. | 1878. | For eight months. 1880. | 1879. | 1878. |
|---|---|---|---|---|---|---|
| To Germany .....Tons | 219 | 390 | 304 | 2230 | 2052 | 2327 |
| England | 115 | 19 | 48 | 1045 | 446 | 121 |
| Belgium | 143 | 197 | 116 | 1885 | 903 | 1005 |
| France | 20 | 61 | 54 | 441 | 294 | 28 |
| Hamburg | 32 | 63 | 45 | 531 | 253 | 43 |
| The United States | — | — | — | 368 | 326 | 10 |
| Other countries | 40 | 69 | 63 | 492 | 162 | 347 |
| Total | 575 | 799 | 630 | 6992 | 4436 | 4534 |

Messrs. RICKARDS and BUDD:—Tin has again improved in price, and to-day we have nearly reached the point attained three months back. Stocks on Nov. 1 were 1000 tons less than at the corresponding period of last year, and if America, as appears likely, continues to purchase the major portion of the Straits tin available for export we ought not to see any reduction but rather an improvement in quotations. The delivery of foreign out of warehouse, London and Holland, is—Jan. 1 to Oct. 31, 1880, 17,090 tons, against 18,250 tons in 1879, and 15,850 tons in 1878. The stock of tin in public stores here and in Holland, omitting Banca in Dutch Trading Company's hands, is—Oct. 31, 1880, 10,200 tons; Oct. 31, 1879, 12,110 tons; Oct. 31, 1878, 12,620 tons.

| | 1880. | 1879. |
|---|---|---|
| Shipments of Straits to England, Jan. 1 to Oct. 31...Tons | 1,680 | 2,855 |
| ,, Australian | 6,248 | 5,756 |
| Total | 7,928 | 8,611 |

The quantity of tin exported from the United Kingdom, Jan. 1 to Oct. 31, as shown by the Board of Trade Returns, was—

| | 1880. | 1879. | 1878. |
|---|---|---|---|
| English .....Tons | 3,701 ....against | 5,132 ....against | 5,335 |
| Foreign | 7,567 | 6,456 | 5,789 |
| Total | 11,268 | 11,588 | 11,124 |

Messrs. BROOKER, DORE, and Co. (Nov. 1) remark:—All our markets remain quiet, and the hopes indulged in at the commencement of the autumn as to a speedy improvement after the holidays have certainly not been fully realised. Copper closing to-day at 61*l.* for Chili bars shows scarcely any change in value in the two months. Straits tin, in which there has been some activity recently, is worth 90*l.* per ton, an improvement of 5*l.* during the same period. Spelter has receded 30s. per ton since Sept. 1.

Messrs. FRENCH and SMITH write:—Tin was in good request throughout the past month, and a rise in value of 5*l.* per ton was established. The higher prices brought out sellers, but buyers showed their confidence in the future by accepting all that offered. America continues to buy in the East, 900 tons having been shipped from the Straits to that continent during October. The deliveries here of Straits and Australian are in excess of shipments, and the general statistical position appears sound. We quote fine foreign, 90*l.*; Banca, 54½ fl.; Billiton, 54 fl.; English ingots, 93*l.*

| | Nov. 1, 1880. | Nov. 1, 1879. | Nov. 1, 1878. |
|---|---|---|---|
| Foreign in London .....Tons | 7,062 | 8,517 | 9,296 |
| Banca in Holland | 1,133 | 1,297 | 1,240 |
| Billiton in Holland | 1,998 | 2,088 | 1,674 |
| Afloat for England, Straits, advised by mail and wire | 400 | 40 | 240 |
| Afloat Australian ditto | 1,587 | 1,700 | 1,580 |
| Afloat Billiton | 938 | 580 | 1,100 |
| Banca in Dutch Trading Co.'s hands.. | 1,659 | 1,420 | 1,112 |
| Banca afloat by sailing vessels | 198 | 595 | 512 |
| Total | 14,975 | 16,237 | 17,154 |

Messrs. VIVIAN, YOUNGER, and BOND write—At the Billiton sale in Batavia, on the 12th ult., 13,000 piculs sold at an average of 58¾ fl. per picul, equal to about 86s. laid down in Holland. The Australian shipments to Europe for October are cabled as 850 tons; from the Straits, 350 tons to Europe and 900 tons to America. The deliveries from London were 1040 tons, and in Holland 1410 tons, including the delivery of 200 tons Australian that had been in stock for a long time past. For such a large delivery in one month there is no parallel more recent than October last year, when 1275 tons were delivered from Holland, and at the same time 1650 tons were taken from London warehouses. Prices have steadily advanced from 85s. to 90s., with large sales. The market closes quietly at 88s. 5d. to 89s. 6d. This advance has evidently induced realisations of

parcels bought some time back, when prices were even higher than at present. The future much depends on America, and it seems reasonable that from that quarter a continuance of the demand may be expected. The stock of foreign tin in London and Holland is thus estimated:—

| | 1880. Nov. 1. | 1879. Nov. 1. | 1878. Nov. 1. |
|---|---|---|---|
| Foreign tin in London ....Tons | 7,067 | 8,530 | 9,339 |
| Banca tin in Holland .... | 1,133 | 1,297 | 1,240 |
| Do. (in Company's hands) .... | 1,059 | 1,421 | 1,112 |
| Billiton tin in Holland .... | 1,993 | 2,089 | 1,674 |
| Total .... | 11,857 | 13,337 | 13,365 |
| Quantity of tin afloat for Europe .... | 3,300 | 2,900 | 3,800 |

Messrs. VIVIAN, BOND, and WATSON: During the past fortnight the market has fluctuated between 86*l.* 10s. to 89*l.* for fine foreign, but a large business has been done, principally at the higher prices, and we close firm at 89*l.* 10s. for Straits and Australian; English, 93*l.* Small sales of Peruvian at 80*l.* to 83*l.*; price to-day 66*l.* to 85*l.*; according to quality.

# Meetings of Public Companies.

## LEADHILLS SILVER-LEAD MINING AND SMELTING COMPANY.

The seventh ordinary meeting of shareholders was held at the offices, Finsbury-circus, on Thursday;

Mr. PETER WATSON (the managing director) in the chair.

Mr. F. R. WILSON (the secretary) read the notice calling the meeting. The reports and accounts were taken as read.

The CHAIRMAN said—Gentlemen, I have not much to say to you to-day, inasmuch as you have had a very full report from Captain Waters on the mine, which fully sets forth the state of affairs both at surface and underground. But with regard to the accounts, I might make some few observations. And, first, you will see that we have done better during the past 12 months than we did in the previous 12 months, inasmuch as we have made a profit of 2879*l.* 7s. 7d., but still there is a balance against the company (that is to say, on the profit and loss account) of 1970*l.* 3s. 1d.—in other words, we had 4849*l.* 10s. 8d. against us on the previous 12 monthly account. Since these accounts were made up we have sold a good deal of lead at 18*s.* per ton advance on what the accounts show here; or what the price was made up at. Still the price of lead, although better than it was 12 months ago, is still very low, but from all we can gather, and from the information which I can obtain, we do think that the price of lead will advance like that of tin, which you are aware has gone up only recently something like 12*l.* to 15*l.* per ton, and it is stated that it is likely to go much higher. Copper is likewise going up, so really I do not see any reason why the price of lead should not follow in the wake. (Hear, hear.) After all, it is simply a question of price of lead with regard to this property, and also several others. If we can get a better price for lead you would see that the accounts would show a deal better than they do now. But I think the affairs really do not exactly show what has been doing during the last twelve months. We have been spending a great deal of money for the future benefit of this undertaking. During the last twelve months, on the dressing-floors at Brow's, we have erected two large jigging premises and large sheds, we have put up four round buddles to slime pits and several launders, and built walls in connection with the road and passes to the ore. On the higher floors we have put in a tramroad, and we have erected extensive sheds for the dressing operations there. At the smelting works, in connection with the lead fume catch pits, we have put in brick walling 28 ft. by 80 ft., and 23 ft. deep. We have extended the flues 600 ft. by 5 ft., and we have added 2700 ft. of flues, and we have done, also, everything in connection with the requirements of our leases. The height of the chimney has been extended; we have made other improvements at the smelting mills; fixed and laid down Portland cement floors; we have done the whole of the work of providing regarding the slags, and at the higher floors we have done a lot of other work; so altogether I should imagine it has come to the best part of 2000*l.* which we have paid for. That has not been taken out of capital account, but it has been charged to revenue, so that we shall find the benefit of that hereafter. (Cheers.) So far as the mine is concerned at present the ends are, comparatively speaking, poor. We have gone through good courses of ore, as you will have seen by the reports published in the *Mining Journal* from month to month. You will have seen from those monthly reports that we have opened up good ore ground, but for the moment our ends are comparatively poor. At the same time we have a good course of ore ahead, which we intend to overtake in the deeper levels, from which we anticipate better things, and one of the great and important points in the mine. When the sinking of Wilson's shaft—which is being pushed on with great vigour and success—is down to the required depth, next twelve months, we shall open good ore ground there, and if lead will only advance we shall not only clear off the 1970*l.*, but be something on the right side, and I hope before twelve months are over we shall have a better state of things, and be able to give some little profit to the shareholders. (Cheers.) In conclusion, the Chairman moved that the reports of the directors and agent, and the accounts, be received and adopted.

Mr. ROBERT WILSON seconded the resolution.

Mr. ROBERTS asked for an explanation of the item of 311*l.* 16s. 11d. for interest and discount.—Mr. F. R. WILSON said that according to the custom of the trade the merchants who bought the lead were entitled to a discount of 2½ per cent. for cash.

The CHAIRMAN: As regards the interest, we sometimes discount some of the ore bills, and that is interest paid to the bankers.

Mr. F. R. WILSON: There is no overdrawn account at the bank, or anything of the sort.

Mr. ROBERTS: What is the meaning of the item of 135*l.* 18s. 3d. for commission on lead sales?—The CHAIRMAN: That is the commission to the agents in Scotland who sell the lead, Messrs. Muir and Co.

Mr. ROBERTS: Cannot we sell the lead direct?—The CHAIRMAN: No; they know the customers, and know they are safe men. We have never made a bad debt through them, and I hope we shall steer clear of them. (Cheers.)

Mr. ROBERTS: Do we sell all the lead through them?—The CHAIRMAN: Yes, chiefly. We sold a parcel of lead at what we called a good price some time ago in London, but we had some difficulty in getting the money.

The CHAIRMAN, in reply to a question, said the present average return of lead ore per month was from 130 to 140 tons.

Mr. GEACH asked what part of the mine they were now chiefly taking ore from?—The CHAIRMAN said from what was called Brown's part of the mine. In driving at the 41 they expected to get a good lode. There were bunches of ore which lasted only a certain time, and they had to drive to get others.

Mr. GEACH: How much are you sinking a month?—The CHAIRMAN: About 2½ fms. per month.

Mr. GEACH asked whether more rapid progress could not be made by means of rock-boring machinery?—The CHAIRMAN said it was an important question, which had not escaped the attention of the board, and which would receive their further careful consideration, but before they could do much in that way it was necessary to get Wilson's shaft down further.

Mr. ROBERTS said he supposed that more ore had not been sold than was necessary to go on with?—The CHAIRMAN: No: we have a large stock. The directors visited the mines in September, and we had then, and I dare say we have now, in all probability, the best part of 10,000*l.* worth of lead and lead ore in stock.

Mr. F. R. WILSON: We have sold 472 tons of pig-lead since the accounts were made up, and since they were circulated we have sold 160 tons.

Mr. ROBERTS: Looking at the low price of lead, it would be wrong to sell more than is absolutely necessary. (Cheers.)

The CHAIRMAN, in reply to a question, said that the directors went to great expense in erecting the flues, and also a large stack; and it was stated in the accounts that in 1878 they saved 38 tons, in 1879 59 tons, and in 1880 76 tons. This showed the necessity of having this work done. The present directors, when they came into office, set to work, and did the work gradually, and would continue to extend the flues in the same gradual way.

A SHAREHOLDER asked whether filters had answered well?—The CHAIRMAN said they had answered very well, and had enabled a saving of 20 or 25 per cent. to be made in the labour.

A SHAREHOLDER asked what was the latest news from the mines?—The CHAIRMAN said the latest intelligence was contained in a telegram recently received from Capt. Waters, who went once and sometimes twice a month to the mine—"All the lead-producing parts are just as when reported last; Russell's sump holed; Wilson's shaft squared to 20 right."

Mr ROBERTS asked whether any steps had been taken to obtain the reduction of the royalty?—The CHAIRMAN said he had been in communication with the representatives of the lords, but up to the present time no satisfactory reply had been received, but he should go on, and hoped to succeed. He did not know any mine more rigorously worked, and he certainly thought that shareholders deserved every consideration at the hands of the lords.

Mr. ROBERTS: What is the royalty?—The CHAIRMAN: One-ninth.

Mr. ROBERTS: It is monstrous. (Hear, hear.)

The resolution for the adoption of the reports and accounts were then put and carried.

On the motion of Mr. ROBERTS, seconded by Mr. BROOMFIELD, the following resolution was passed:—"That the directors be requested to press further upon the lords the necessity of making a further substantial reduction in the royalties."

The CHAIRMAN said in Cornwall and elsewhere the lords had come forward in a liberal manner and made reductions in the royalties. Had it not been for that many mines could not have been kept open at all. He could only say that the directors would continue to press the matter on the consideration of the lords.

Mr. ROBERTS proposed that Mr. Peter Watson be re-elected a director. He said he knew that Mr. Peter Watson had given a great deal of time and ability to promoting the welfare and prosperity of Leadhills, and he was sure that all the shareholders would wish to see him again elected. (Cheers.)

Mr. BROWN seconded the resolution.

Mr. SAMUEL YORK (a director) said he had the very greatest pleasure in supporting the motion, and to bear testimony to the indefatigable exertions of Mr. Peter Watson in promoting the interests of this company. (Cheers.) During the present year he had several times visited the mine with Mr. Peter Watson, and could speak to the great knowledge and devotion which that gentleman had brought to bear in the discharge of his onerous duties. (Hear, hear.) From the commencement Mr. Peter Watson had laboured hard with the lords to get the dues reduced, but so far with little success. With regard to the work which had been done at the mine, it was a thousand pities that the shareholders did not pay visits to the property; and see how well their interests were looked after; he was sure if they visited the mine, and saw how well the money had been expended, and the work which had been done, they would be highly gratified. (Cheers.) The whole of Leadhills had been completely changed to what it was when the directors took over the property, and the improvements which had been introduced had led to a very large saving in the expense. What they wanted to enable them to pay dividends to the shareholders was an improvement in the price of lead, and he hoped they would see that before long. He hoped the shareholders would visit the mine, and see for themselves that the directors had left nothing undone to put the property in a first-class and paying condition. (Hear, hear.)

The resolution was put and carried.

The CHAIRMAN, in acknowledging his re-election, said that the directors were the largest shareholders, and, therefore, deeply interested in making the company a success. But they wanted a better price, and also some more encouragement at the hands of the lords. He hoped and believed that twelve months hence the directors would be able to submit a better state of accounts to the shareholders. (Cheers.)

On the motion of Mr. BROWN, seconded by Mr. BLOOMFIELD, Mr. Edward Ashmead was re-elected auditor.

Mr. ROBERTS moved that a cordial vote of thanks be passed to the Chairman and board of directors for their able management of the company's affairs. Speaking as an individual he was quite satisfied with the statement, and thought the board had done very well considering the depressed condition of the lead market. He would include in the resolution a special vote of thanks to the Chairman for his courteous and able conduct in the chair.

Mr. BROOMFIELD, in seconding the motion, said the shareholders owed a great deal to the directors for the trouble and labour they had taken in looking after the interests of the company. He believed this company possessed the largest extent of any lead mines in the kingdom, and if lead had gone better shareholders would have got good returns simply on the accounts now submitted Had lead been what it was two years ago it would have made a difference of 4400*l.* He hoped they would shortly return 200 tons per month, the same as Roman Gravels, which was one of the best mines in the kingdom; and with the present vigorous and experienced management, and with only a moderate increase in the price of lead, he hoped before long they would have a fair dividend: 200 tons per month would give a profit of something like 1000*l.* per month, which was 10 per cent.

The resolution was put and carried.

The CHAIRMAN acknowledged the compliment, and said he fully endorsed all that had been said regarding the excellence and promise of the property.

Mr. J. BROWN (a shareholder who had visited the mines recently) said that if the shareholders would visit the mine they would see a great alteration in the appearance of it during the past few years.

The meeting then broke up.

## PARYS COPPER CORPORATION.

The third ordinary general meeting of shareholders was held at the offices of the company, Finsbury Circus, on Nov. 5,

Mr. J. Y. WATSON in the chair.

Mr. F. F. WILSON (secretary) read the notice calling the meeting.

The CHAIRMAN said that this was an intermediate meeting, and not the annual general meeting, and therefore no formal accounts were submitted; but since the last annual meeting, when the accounts were presented, ore precipitate and ochre had been sold, which had realised 2125*l.*, and the present amount of assets over liabilities was 4900*l.* A few minutes before the meeting Captain Mitchell had received a telegram that a communication had been made between the level from the 90 cross-cut and the Colonel's shaft, which would enable them to work the ore from that point. Therefore, they hoped to raise a considerable quantity of ore from that point, and continue the cross-cut south. Capt. Mitchell stated that if copper rose to 15*s.* per unit he could work the mine at a profit. About a fortnight ago a shareholder went down the mine, and took with him a practical mining agent to inspect and report on it; he had been favoured with a copy of the report, and if the shareholders wished the secretary would read it.

The SECRETARY read the report, as follows:—

*Oct.* 25.—The following is a brief report of what I saw underground on Saturday, together with the thoughts that impressed my mind after a careful consideration of the whole facts that presented themselves to my notice. In the 90 cross-cut, which is now driven over 200 fathoms, I observed that four lodes have been intersected, and all of them have a very promising appearance. The first when driven on will produce tribute ground, even should it not much improve; the second is worth about 2 tons of copper to the fathom; the third is not so good, but produces good stones of copper. This lode is driven on for some distance to communicate with Colonel's shaft, which when done will be a good thing for the further development of this part of the mine. There are about 2 fms. more to drive to reach the shaft, and there are about 2 fms. more to sink in the shaft, which will take about a month more to do. There is now in the forebreast of this end a very strong lode of sulphur, with a little copper mixed with it. There is also copper in the shaft, and I should not be surprised if in a short time after the communication a large section of ore ground would be opened on this lode and the next one near it. Passing by this lode for a short distance there is apparently a large bunch of copper, from which 12 tons of ore has been sampled, and so small is the excavation that one would scarcely notice that anything but driving the level had been done. As this has not been opened on any further it is difficult to say in what direction it is running, or what lode it really is; but I do not think that that question for the present is of much importance as long as you have the ore. On the fourth lode, or I might say I think the fifth, there is a strong bunch of sulphur, with good stones of copper mixed with it. A blast was put out while I was there, which showed what I have stated. This would be about 15 or 20 fms. from the forebreast of the cross-cut, which is now on a change of rock. I did not notice how far they had driven in this clay-slate formation, but I do not think it can be many fathoms. This rock resembles very much that in the great opencast, which contains the main lode, and there cannot be much doubt that that lode when reached will be rich in copper at this level, as the ground appears to be quite undisturbed by any influence whatever. It appears there are about 20 fms. more to drive to reach the perpendicular of the lode at the 45, and it is thought that if the lode continues on the same inclination as underlie as it has above and about that level that 5 or 6 fms. more of driving will reach it. Now, it is a question whether it will or not, because all the lodes and branches that have been cut, as far as I could see, are either nearly perpendicular or underlying south, and, therefore, if the lode that is being driven at should be the same it will require 20 fms. more driving at least, and the distance above that will be in proportion to the southerly inclination. One thing which gives one to expect it to incline north is the dip of the stratum, which is in that direction, and I should scarcely think that it would change its underlie under such circumstance; at all events, I should not feel discouraged until I had driven 30 or 40 fms. further. Although the driving of the 90 cross-cut has been a long, tedious, and expensive work, yet I believe that it is the best thing that could have been done, and I am fully persuaded in my mind that the shareholders will recoup doubly the money that has been spent in the operation. The manner in which the mine is worked is very praiseworthy, and reflects great credit on the management, and, although there may not be the amount of wealth remaining that has been realised in by-gone years, yet there can be but little doubt that the riches yet to be obtained are equal to the most sanguine expectations.—J. ROBERTS.

The CHAIRMAN, in reply to a question, said Capt. Roberts was a thoroughly practical man, and was one of the agents for D'Eresby Mountain Mine.

Capt. MITCHELL said at present they were selling second-class ore, and the first-class ore was kept idle. The raisings were now from 90 to 100 tons per month, but this quantity could be considerably increased provided the copper market improved.

The CHAIRMAN said that the ore which was being sold was from the Carrogdol lode.—Mr. BRABY (director) said the Carrogdol lode contained an enormous amount of copper still unworked; but it was not worth while extracting it till the price went up, especially as the copper in that lode was not quite so rich.

Capt. MITCHELL, in reply to Mr. Wagstaff, said the present average of the ore was 7 and 8 per cent.—Mr. F. W. WILSON: It would pay our expenses if we got plenty of 7 and 8 per cent. ore at the present price.

The CHAIRMAN: Our grand point is the cross-cut going south; but even from our present discoveries we shall be able to work the mine at a profit with a better price for ore.

Mr. BRABY said they had been paying a somewhat high price for driving, owing to the deficiency of air and ventilation; but now that the communication was effected it would be worth while working the lodes which had been passed.

Mr. WAGSTAFF (pointing to a handsome specimen of ore on the table) asked whether it was a picked piece?—Capt. MITCHELL: No; we could have picked better than that.

Mr. WILSON, in reply to a question, said they could not have put in any boring machinery and work to advantage with 200 fathoms of rods; but they could put in boring machinery and work to great advantage from the Colonel's shaft, by which means the mine could be worked with much greater rapidity. It was wonderful how quickly the level had been driven the distance it had.

Mr. HILL: Will you sink the Colonel's shaft lower?—Capt. MITCHELL: It may be advisable if the mine opens up well. Capt. Roberts says it may be 20 fms. to drive to get under the perpendicular, but all depends upon the underlie of the ore. At any point we are now we may expect to get ore.

Mr. HILL: At the present moment it is rather guess-work that we have a deposit?—Mr. WILSON: No; we have ore up from the bottom of the opencast.

The CHAIRMAN: 12 tons of ore were got out of one point passed through in the 90 cross-cut, but we could not work it for want of ventilation. The great deposit of ore in the opencast was made by a series of lodes and branches.

Capt. MITCHELL, by means of a plan and section, explained the position of the workings, and said the latest indications were good; they were getting patches of silver and little streaks of copper, which were feeders to the main lode.

Mr. WILSON said the mine was being developed as rapidly as possible. The improved ventilation would enable them to put on more men, and also work the mine deeper.

The CHAIRMAN then moved that the reports of the directors and agent be received and adopted, which was seconded by Mr. WAGSTAFF, and carried.

Mr. WAGSTAFF: Are you as sanguine as ever, Capt. Mitchell, as to the future of the property?—Captain MITCHELL: Yes; quite as sanguine.—A vote of thanks to the Chairman and directors closed the meeting.

## THE GRIFFIN SILVER-LEAD MINING COMPANY.

The second annual general meeting of shareholders was held at the offices of the company, Gresham-street, on Nov. 4,

Mr. WILLIAM ELLISON in the chair.

The SECRETARY having read the notice convening the meeting, and also the minutes of the last annual general meeting, the report and statement of accounts were then taken as read.

The CHAIRMAN, in introducing the business, said—Gentlemen: The report for the past year is concise, and comprises all that I can say on the subject; but while I am on my feet I cannot refrain from stating how sincerely and heartily I personally regret that we have not been able ere this to develope more fully the resources of your mine. When I spoke to a few friends of mine at the outset and asked for their co-operation I hoped, and fully expected, that a dividend would be declared at the end of the first year. Gentlemen, I had then to learn that mining, although sometimes very profitable, is sure to be more or less laborious, taxing the patience very severely at times before it realises the hopes of those concerned. I am now prepared to say that every sovereign we have expended has been judiciously spent—indeed, we have been told by experts that we have done some things which had better have been left undone, while we have left undone some things which we ought to have done; but I do state most emphatically that every penny has been honestly spent to the best of our judgment and with the best intentions, and I may say our labours have not been in vain, for we are proud to be able to tell you that our reserves are estimated to be worth 15,000*l.* A short time since we retained the services of a well-known mining engineer, and arranged that he should visit and inspect the mine, and advise us as to what was best to be done fully to develope its resources. That gentleman went down to the mine, and on his return he assured us that if we could acquire one of the adjoining setts which he indicated we should have the finest and best mining property in the Principality, and he added that if we were prepared to adopt his advice, and would place the future working of the mine in his hands, he would subscribe for 4000 shares at par, and which has been carried out to-day. We purpose securing the valuable services of this gentleman, who advises us that it will be necessary to sink a shaft and fix certain machinery, and we hope and believe that before we next have the pleasure to meet you we shall be in a position to declare a satisfactory dividend.

It was then moved by the CHAIRMAN, seconded by Mr. SPRAGUE, and resolved unanimously, that the report of the directors and balance-sheet of the company be and are hereby adopted.

The CHAIRMAN, in introducing the next resolution, stated that he would ask his colleague, Mr. GATE, to afford the meeting the fullest information respecting it, and he had no doubt that it would meet with the hearty approval of the shareholders. The resolution is as follows:—"That this meeting confirms and cordially approves an agreement entered into by the directors, dated the 1st Inst., for the purchase of the adjoining mining sett, known as Cyrau."—This was moved by Mr. CHAPMAN, seconded by Mr. GATE, and carried unanimously.

Mr. GATE said, in seconding the proposition, he had much pleasure in recommending this purchase. He had some time since examined the property with the intention of purchasing a half interest therein for himself; but came to the conclusion that the ores therefrom could be more profitably extracted by working in combination with the Griffin, and using their roads and levels, than otherwise, and, therefore, recommended that this company should acquire it; the its value as a mining property is undoubted; and that the old workers had extracted 80 tons of ores from the main lode without working to a greater depth than 6 fathoms; and that the terms of purchase were unusually moderate—being 3500 fully paid shares of 1*l.* each in this company and 500*l.* in cash, the cash payment being less than the amount of money actually expended on the property, and the vendor showing his confidence by accepting a large portion in shares.

The CHAIRMAN, in submitting the next resolution, as follows—"That the meeting hereby authorises an increase of capital of the company to the extent of 10,000*l.*, to be raised by the issue of 10,000 shares, such shares not to be issued within six months from the date hereof, and when issued to be in the first instance offered to the then existing shareholders at par, *pro rata* to their holdings"—made a few remarks to the effect that it would arm the directors with the necessary powers; but at present there was no intention to issue any of the shares.—This resolution was then, on the motion of Mr. GATE, seconded by Mr. LEWIN, formally put to the meeting, and carried unanimously.

The CHAIRMAN then stated that the next resolution on the paper, and which he had great pleasure in submitting to the meeting, was as follows:—"That Mr. John Davies be and is hereby re-elected a director of the company"—which, being moved by Mr LEWIN, and seconded by Mr. GATE, was carried unanimously.

Mr. DAVIES, in returning thanks, said he looked upon his re-election as a proof of the shareholders' confidence in him. All he desired was the certain and ultimate success of the company, and which he was sanguine of attaining. Both his colleagues and himself would use every effort to gain that end, with a view to realise a satisfactory return to all concerned. The directors were largely interested, holding as they do more than a third of the capital, and, such being the case, it must be evident to the shareholders that they have a strong interest to make the company one of the most remunerative in the Principality.

The CHAIRMAN, in moving the next resolution, took occasion to speak in complimentary terms of the company's auditor, who he said was most painstaking, and the resolution he then had to put was as follows:—"That Mr. John Ball be and is hereby re-elected as the auditor of the company for the current year, which, being moved by the CHAIRMAN, and seconded by Mr. DAVIES, was carried unanimously.

The ENGINEER referred to in the report, and who had recently visited the mine, being asked to give his opinion as to the property, said that he had a very high opinion of it, and was pleased with the prospects of the company, and the best proof of his confidence was evidenced in the fact that he had agreed to take 4000 of the shares at the disposal of the company. As for the adjoining property—Cyrau—now acquired by the company he considered it a most judicious purchase, and no doubt ultimately will be worth three or four times the amount paid for it.

The CHAIRMAN having intimated that the business of the meeting had been got through, Mr. FRANKLIN said that, in proposing a vote of thanks to the Chairman, he wished to express his high appreciation of the manner in which the directors had conducted the business of the company, and which deserved the thanks of all the shareholders. Now that additional capital had been subscribed he had no doubt the works would be pushed forward rapidly and brought to a successful issue.

The CHAIRMAN having briefly replied the meeting was then brought to a close.

## SOUTH WHEAL FRANCES MINING COMPANY.

The four-monthly general meeting of shareholders was held at the mine on Nov. 2,—Mr. S. ABBOTT (purser) in the chair.

The statement of accounts submitted showed a profit on the sixteen weeks' working of 96*l.* 18s. 6d., and a credit balance of 216*l.* 18s. 1d.

The CHAIRMAN was sorry to be unable to show them a better profit. Their present profit was certainly a very small one after the large profits they had made during the last two or three years. It might, however, to a certain extent be explained in the manager's report, in which it was stated that the labour costs and merchants' bills included sums amounting to nearly 1500*l.* for extra work. This expenditure included the building of a new engine-house in the western part of the mine and purchasing of extra materials.

The accounts were received and adopted, and the report of the agents upon the various operations in the mine submitted. At the conclusion of the report Capt. James says—"Probably this will be the last time that I shall have the pleasure of giving a report on this mine. About eight years ago I found it deeply involved in debt, surrounded with innumerable difficulties, and threatened with various lawsuits, with only one redeeming feature—the lode or section of the flat lode at a depth. From all these difficulties the mine has been released, and the great object in view has been successfully accomplished. During the past two years and a half about 17,000*l.* has been divided amongst the fortunate adventurers, and upwards of 8000*l.* spent in plant, dressing floors, &c., all out of revenue. Let me now urge you not to sell your birthright to those who are neighbours for a flimsy pretence, or give away your property to those who have cause to envy your position. If you value my opinion be good enough to act upon it, and have nothing whatever to do with the amalgamation scheme at any price."

The CHAIRMAN read a letter from Capt. A. T. James, tendering his resignation, not he said, because he had less faith in its future prosperity or of its increasing importance, but simply because he was unable to devote so much time and attention to the mine as its immediate necessities seemed to require.

Mr. TONKYN observed that the report was signed by Capt. James and the mine agent, and enquired whether Capt. James personally inspected the mine and valued the various points himself?—Capt. JAMES replied: Yes; is that an answer to your foolish question. He also stated that he was underground on all last week.

The CHAIRMAN said he should have been very pleased to have heard Capt. James state distinctly his reasons for resigning. He might state that some time ago Capt. James expressed a desire to be relieved of the responsibility, and based that desire on his having met with a serious accident underground, which in the performance of his duty, and since then he had not been able to give much of his attention to his duties as he wished to do, as his medical attendant had gone so far as to say that South Frances was not a good mine for Capt. James on account of its great depth.—Capt. JAMES could assure them that whether the amalgamation scheme had cropped up or not, he should have tendered his resignation at that meeting. They knew it was more than twelve months since he received a very serious injury to his ankle, and he had not been able to do duty from that day to the present. Whenever a change of weather set in he was unable to walk. He also found that he was unable to climb from a depth of 250 fathoms, and therefore he had not been able to go underground to watch operations as he ought to have done. He had, however, been ably assisted by his colleague, Capt. Opie, who had done his own duty and a great part of that of although he (Capt. James) had had the management.

Mr. J. CLAUDE DAUBUZ said that, as shareholders in South Frances, they would be pleased to hear the statement laid before them by the manager, but he, in common with another shareholder, was very much surprised to hear of a very different statement which has issued by him (Capt. James), without being asked, apparently, about a fortnight since. That statement was very different to what they had heard there that day. It was to this effect:—"South Wheal Frances, Oct. 18, 1880.—SIR,—If you are still a shareholder in the above mine I would advise you to sell at once, for the following reasons:—The mine is not looking so well. Our best stopes are quite exhausted, and the bottom levels are not as good as they were. I shall retire from the management at the coming account. Should you decide on selling your interest, if you will kindly telegraph to me forthwith I will do my best for you. (Signed) A. T. JAMES." The effect of this

from the manager on this particular shareholder was, as might be imagined, rather startling. He (the shareholder) thought his property might be worthless, and he put himself in communication with him (the speaker). He (Mr. Daubus) told the shareholder to whom that letter was sent that he had a different view in consequence of an independent examination he had of the mine a few weeks ago. He thought the letter was rather inconsistent with the agents' report presented that day. Under the circumstances he begged to move that the managers' resignation be accepted.

Capt. JAMES said he wished to make an explanation. Several shareholders had written him to know whether, in consequence of the price of shares going up so rapidly, any improvements had taken place, and he had replied stating that there had been no improvement. He took the liberty to state to some of those gentlemen that the best thing they could do would be to sell their shares at the advanced price, and if he was asked the question by any gentleman, he would most certainly give him the same advice

The CHAIRMAN, after some discussion as to Capt. James's resignation, remarked that as he had before stated Capt. James had expressed his wish to resign, and even went so far as to write out his resignation four months ago. He did his utmost at that time to induce him to remain on, and he did so. He urged upon him the same reasons as Mr. Waddington had, that inasmuch as he had been a party to the renovation and bringing the mine through its difficulties, he put it to him whether it would not be better for him to stay until the completion of his work in order that people might not say, as they had already said, that he was forsaking a sinking ship. He thought they were losing a very efficient servant. He had been associated with Capt. James for many years, and he had seen that he had used his best energies in endeavouring to promote the prosperity of the property.

Mr. W. H. RULE caused much laughter by suggesting that 200 guineas should be given to Capt. James on his retirement; and Mr. LANYON, after suggesting that a gratuity of 100 guineas for Capt. James should be subscribed by individual shareholders (which suggestion was not well received), proposed that a letter having been read from Capt. James resigning his appointment as manager, and Capt. James having been pressed to reconsider his decision without effect, received, that Capt. James's resignation be accepted, and that this meeting desires to express their regret at the loss they are likely to sustain by that resignation, and their obligations to him for his efficient services during his tenure of office, and that he be presented with the sum of one hundred guineas from the funds of the mine.—Mr. MAYNE, in the course of the discussion which followed in regard to Mr. Lanyon's proposition, said that a great many of the shareholders had come into the mine at a high price, and now that the dividend was gone he did not think they ought to subscribe the 100 guineas out of the funds of the mine. If they had a personal subscription he would be happy to subscribe, but he should object to the amount being taken out of the funds of the mine. He knew that if the amount were taken out of the funds of the mine it would cause a great deal of dissatisfaction amongst some of the shareholders; they had invited Capt. James to stay, and he had been in receipt of wages while he was there, and why should they vote him 100 guineas now he was going to leave?—Mr. WADDINGTON said it was to be given not merely as a present, but as a recognition of services rendered.

Upon the motion being put to the meeting, the CHAIRMAN declared it carried; but Mr. MAYNE protested, and Mr. BUDGE stated that several shareholders present were of the same opinion as Mr. Mayne. A committee was appointed to select a new manager.

The CHAIRMAN stated that that was all the ordinary business of the meeting, but he thought it would be a folly on their part to shut their eyes to what was arrived at at West Basset meeting a few weeks ago, when a committee was appointed to confer with South Frances about amalgamating the two mines. He thought before they separated they should have a little talk on the subject.

Mr. J. C. DAUBUZ, as Chairman of the West Basset committee, said that some time ago there was a communication made about Mr. Basset's property, in which both West Basset and South Frances were informed that they had incurred a penalty of 500*l.* each in breaking through the barrier which was reserved by the lords between the two setts. He pointed out at the time it was fully understood by the committee that that reservation was intended simply to prevent litigation between the two mines. Litigation had been carried to a wasteful extent, under the previous leases, by the two mines. Acting on that suggestion, a committee was appointed by the adventurers of West Basset and South Frances to confer with the representative of Mr. Basset, at Tehidy office. They met Mr. Bolden, and explained their views on the subject. When the subject had been brought up the suggestion occurred to someone's mind—he could not exactly say who, but some shareholders of South Frances Mine—that the present might be an opportune time for an amalgamation of the two properties. The advantages that would accrue had, he believed, been very freely discussed. In the first place, there would be a permanent settlement of the water question, and a fair distribution of the pumping charges; secondly, there would be an avoidance of all possible litigation about boundaries, and further, the reserve boundary would be available for working on; and thirdly, there would be an enlargement of the area of the set which could be worked on a proper scale. Surveys had been made both at the request of West Basset and South Frances adventurers, and those who surveyed the mines were agreed that if the amalgamation could be carried out it would be to the advantage of both parties. If it were the pleasure of the adventurers present to appoint a committee to confer with the West Basset Committee, they would be very pleased to do so. Replying to the question of a shareholder, he continued that undoubtedly in working the mines as one large concern there would be much more economy than if they continued working as two separate concerns. There would be a saving effected in pumping the water, and compressed air would be supplied on a very much more economical scale, by having one large machine instead of so many small ones. They were both good properties, and it appeared to him certain that, if an amalgamation could be arranged and a good man put at the helm, they would derive a lasting benefit from it.

Mr. BOLDEN (Mr. Basset's agent) said, with regard to the question under the discussion, he was satisfied that the lords would derive benefit from the amalgamation; and, therefore, he thought it advisable to advise his employer to support the scheme of working South Frances in conjunction with West Basset. He was sure the scheme would receive no opposition from Mr. Basset, and he had spoken to two or three of the other lords, who seemed favourable to it.

A committee was eventually appointed to confer with the West Basset Committee, and to bring up a report to a special meeting of the adventurers, consisting of Capts. James and Priske, and Messrs. A. Lanyon, J. Mayne, *J. H.* Dingle, G. Carter, with the purser *ex-officio*.

The usual complimentary votes terminated the proceedings.

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RHOSESMOR.—At the meeting of shareholders at Chester on Oct. 30 (Mr. W. Maysmor Williams in the chair), the report showed that the number of unissued shares had now been reduced to 1155. The chairman congratulated the shareholders on the improved financial position of the concern. The retiring directors were unanimously re-elected, and Mr. J. E. Edwards was re-appointed auditor. It is stated that since the agent's report the new lodes are turning out not even richer than was reported, and the forebreast in the Westminster lode was on Thursday, above 4 ft. wide, full of lead. The sale of lead on Thursday was to be 60 tons.

GUNNISLAKE (Clitters).—At the meeting on Nov. 2 (Mr. J. C Isaacs in the chair), the accounts showed a credit balance of 73*l.* 2*s.* 4*d.* The committee reported that a profit of 607*l.* 15*s.* 9*d.* had been made on the four months' working, after allowing 200*l.* toward the 13 months' cost. They recommended a dividend of 1*s.* per share, which would absorb 491*l.* 10*s.*, leaving a balance of 233*l.* 19*s.* 4*d.* to be carried forward to the next account. They congratulated the shareholders on the resumption of dividends, and as the samplings are now considerably increased, the committee recommended that the sales in future should be monthly instead of bi-monthly. The above recommendations were adopted, and the payment of the dividend sanctioned. Mr. Sharp entered into a discussion with reference to the accounts, and pointed out that some members of the committee supplied materials to the mine, which he contended was not right. He also criticised some of the merchants' bills, but failed to obtain the support of the meeting.

OLD GUNNISLAKE.—At the meeting on Nov. 2 (Mr. J. C. Isaac in the chair) the accounts showed a debit balance of 143*l.* 4*s.* 7*d.* A call of 1*s.* 6*d.* per share was made. The committee reported that they were making arrangements for the purchase of a boring machine, air compressor, receiver, &c. Messrs. J. C. Isaac, W. Matthews, R. C. Seccombe, T. W. Greenfield, and F. Nicolls were reappointed the committee, and Mr. Thomas Horswill was appointed auditor at a salary of 2*l.* 2*s.* a month. Mr. J. Sharp moved a resolution to the effect that no paid officer should be a member of the committee; but on being put to the meeting the motion was lost. It was stated that there were 1115 unallotted shares, and a discussion arose as to how they should be dealt with; and it was ultimately decided that the shares should be offered to the adventurers *pro rata*, at 3*s.* a share, being the amount of calls made upon them; and if any were not taken up, the committee might offer them for sale by auction.

[For remainder of Meetings, see to-day's Journal.]

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ST. JUST UNITED.—This mine, situated on the cliff at Cape Cornwall, is looking better every day, and will doubtless become one of the best in the district. Mr. Sholl was here last week, and commenced the practical running of his pneumatic stamps. There has not been time to give technical results, but a system has been commenced (weighing out coal and tinstuff) by which the average of a month's stamping (night and day) will be placed before the mining public.

STARTING OF NEW TINWORKS AT CWMAVON.—The new works that have been for some time in course of erection have at last been completed, and the first bar of the iron was rolled on Wednesday morning. The building, which was some years ago used as a rail mill, is very extensive. Sixteen furnaces are now in full work, which is estimated, consume 58 tons of coal daily: 70 or 80 men are engaged at the works, which, with the extra colliers and others employed throughout the valley in connection with the undertaking, afford all probability increase the amount of wages paid monthly by £600. The superintendence of the erection of all the machinery has been conducted by Mr. L. Marshall, engineer to the Governor and Co.'s successors. The other portions were in the hands of Mr. Harris.—*South Wales Daily News.*

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## COAL, AND COAL MINING.

The utility and the comprehensive character of the rudimentary treatise "On Coal, and Coal Mining," by Mr. WARINGTON SMYTH, M.A., F.R.S., of the Royal School of Mines, Jermyn-street (London: Crosby Lockwood and Co., Stationers' Hall-court), were noticed when the volume first appeared, 14 years since; and the fact that it has now reached its fifth edition is an evidence that its practical value has been widely recognised. The primary object of the book was to supply sound elementary instruction—an outline, in fact, which, although conveying only a general description of the methods and appliances employed in various districts, should be thoroughly reliable, and capable of being filled up either with such information as the student may acquire by subsequent reading or by actual practice underground. As the fifth edition is revised so as to make it accurate to the present time, those who read it need not fear that the information derived from it will be in arrear of current practice, whilst those who are familiar with previous editions will be able to ascertain in what respects improvements have been made and what improvements are still desirable. Coal-cutting machinery, for example, and apparatus for wedging down coal, so as to render unnecessary the use of explosives underground, are both too far from perfection to be brought into practical use, and there are many other appliances described in the book which, although indicating steps in the right direction, may lead the thoughtful reader to suggest something better. Mr. Smyth shows that the startling observation made about 1860, that the British output of coal is doubled in 20 years, held good till over the year 1877, but at length, instead of the early increment of 3,000,000 tons, a diminution has appeared which must tell upon the arguments of those who discussed the duration of the coal fields.

The author acknowledges the assistance rendered him by Mr. Carruthers, F.R.S., the eminent botanist of the British Museum, in revising the chapter on the plants of the coal measures and bringing it abreast of the most recent views, and he points out that a revolution has taken place throughout the country in the substitution to a great extent of mechanical agents for the furnaces employed in ventilation, and that in a less degree the pattern of engine is changing, and particularly in pumping, where the "Special" and Davey's compound differential engine are gaining favour. Prof. Smyth also remarks that a change which he has for years watched in his advance, and to which he can refer as soundly and widely beneficial, is the general improvement brought about by the action of Institutes of Mining Engineers. In these societies, now founded in most of our coal districts, the old local jealousies are swamped and questions of practical work and scientific research investigated and described. The chapter on the use of coal contains an interesting historical sketch, although necessarily brief, whilst the succeeding chapters describe respectively the mode of occurrence of coal, organic remains and origin of coal, the coal fields of the North, of Central England, of the West of England, South Wales, and Ireland, of Continental Europe, of North America, of Asia, and of the Southern Hemisphere.

From the tenth chapter onward the matters treated of are exclusively connected with the practical working of collieries. Commencing with the consideration of the search for coal boring and the sinking of shafts, Prof. Smyth deals in succession with the driving of levels and cutting the coal, post and stall and long work, conveyance underground, raising the mineral in the shafts, drainage and pumping, lighting of the workings, ventilation, and colliery accidents and their prevention. There is, lastly, a chapter on the duration of the British coal fields, in which the author remarks that it is a miserable sight to see a part of a seam—the roof or benches, as the case may be—when a parting becomes so thick as to prevent the whole group of beds from being conveniently worked together, abandoned and left uncared for, with the probability that when the present generation has died out there will be no sign to show that there is still lying there neglected a tract of what at some future day might offer a profitable working. And intolerable, again, it is to observe corners and plots of ground sacrificed on account of the inconvenient division of properties on the surface; when often the avarice or inertness of some holder of surface fields operates as a bar to the regular working of colliery properties, and of course as an obstacle to the development of the national store. An excellent index renders the book available for reference, and although the volume was specially designed for students there is much which will prove new and useful to men of longer experience.

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SOW AND REAP.—The November number of the excellent little magazine bearing this title, and issued by Messrs. Thompson and Sons, stock and share brokers of Plymouth, contains several interesting and useful articles. The financial record for the month shows a very gratifying improvement in business. The articles on the silver question, and caution to investors in silver mines, are well worth reading, as are also those on a bull-ring, and on Turkish financial difficulties. The whole number is carefully and thoughtfully written, and will be read with pleasure and advantage by investors generally.

OUR RAILWAY SYSTEM.—The fourth annual edition of Mr. WM. FLEMING'S Index to our Railway System and our Leading Lines has just been issued (London: Effingham Wilson, Royal Exchange), and brings the information down to the present time. Mr. Fleming states that notwithstanding that dividends have, as a rule, been comparatively well maintained during the past two years, in spite of considerably diminished earnings, and that improvement is anticipated in the forthcoming dividends of the half-year just ended, shareholders cannot be congratulated on the circumstance; it is illusory, and calculated to withdraw their attention from the ominous surroundings of their investments. During 1878, allowing for nominal additions, 15,940,641*l.* of capital was expended, partly on a few small extensions, but the major portion on what by the most palpable subterfuge, are denominated improvements and additions to the old lines, with the result that the gross earnings on the lines of the United Kingdom were 110,654*l.* less than in the previous year. During the two years 34,398,956*l.* of capital has been expended to earn 1,196,625*l.* less than in 1877. The clear and methodical manner in which Mr. Fleming gives his information is well known; it will, therefore, suffice to say that the present volume is in every respect equal to its predecessors; it is a work which no investor or other person interested in mines can afford to be without.

PRACTICAL AND SCIENTIFIC INFORMATION FOR COLLIERY MANAGERS.—With a view to assist candidates in pursuing their examinations for certificates of competency as colliery managers, Mr. W. WARDLE has written a reference book of practical and scientific information, and as the author has himself obtained a certificate of competency, it must be assumed that he knows what will satisfy the examiners. The information is given in catechetically, and the volume, which is published at the Colliery Guardian Office, Essex-street, Strand, is a handsome and well-printed octavo, of nearly 200 pages. Unfortunately, many of the answers are not correct, and are moreover misleading, whilst some are simply funny; this is the more regretable as the idea of the book is unquestionably good, and had it been revised by some one acquainted with the sciences dealt with it might have been made really useful. One or two of the questions and answers will suffice to show the character of the book.—If chalk be found at the surface, does that preclude the possibility of finding coal underneath? By no means, for coal has been found beneath the chalk in Prussia. Again—Give the chemical composition of water. Water consists of two parts by weight of hydrogen, and 16 parts by weight of oxygen, and its chemical symbol is, therefore, $H_2O$; it therefore indicates not only that it is composed of two parts, by weight of hydrogen, and 16 of oxygen, but also that two volumes of hydrogen have united with one volume of oxygen to form two volumes, or one molecule of water gas. Chemists will also be surprised to learn that $ON_5$ is the symbol for air. A barometer is a straight glass tube filled with dry mercury, closed at one end; the open end is placed downwards in a basin containing the substance. There are three kinds of thermometers:—Fahrenheit, Centigrade, and Reaumur's. These come under the head of meteorological paradoxes. The work is divided into nine chapters—geology, chemistry, boring, sinking, tubbing, walling, &c.; meteorological paradoxes, ventilation, varieties of coal and other fuel, practical mining relating to underground workings, steam, steam-boilers and engines, pumps, shafts, ropes, cages, &c., mathematics, and land and mine surveying. The volume is admirably illustrated with both wood engravings and plates.

STATIONARY ENGINE DRIVING.—This is a practical manual for engineers in charge of stationary engines, by a practical man. Mr. MICHAEL REYNOLDS, a member of the Society of Engineers (London: Crosby Lockwood and Co., Stationers' Hall-court), who maintains, and perhaps justifiably so, that no matter how good and well-tested a steam-boiler or a steam-engine may be, accidents to boilers and machinery will take place, so long as the men in charge are not put to any qualifying test themselves, although, even upon this question difference of opinion exists, for an experienced locomotive manager of the Great Western Railway once declared that the clever engine-driver was the most costly nuisance connected with the working of the line, inasmuch as he applied remedies gratuitously instead of reporting a discovered defect and having it set right by competent men regularly employed for the purpose. This, too, will probably account for the failure of the project of establishing a system of certificates of proficiency for enginemen—a half-taught engineer would be created, who would be of no greater value as an engine-driver, and utterly worthless as an ordinary working engineer. To the young working engineers Mr. Reynolds' volume will prove of especial value, since it will afford him such an acquaintance with all the parts of an engine and their uses that his practical work in the shop will be much facilitated. An interested historical notice of the steam-engine and boiler is followed by chapters on the properties of the materials of which engines and boilers are made; the condencing beam-engine, the Cornish pumping-engine, the horizontal-engine, oompound-engines, Cornish and Lancashire boilers, the Galloway boiler, starting and working an engine and boiler, management of the fire, management of the feed-water and boiler-feeders, causes of failure, steam-boiler explosions, the indicator and how to work it, and arithmetical calculations for enginemen. The information is collected with much care, and may be accepted as thoroughly reliable, whilst the value of the volume is much enhanced by the excellence of the engravings and plates by which it is illustrated.

LONDON SMOKE AND FOG.—Under this title Mr. Frederick Edwards, jun., has given some useful observations on the country parson's grate and other modern fireplaces, which will be read with interest by a large number of persons, there being few writers on the subject of longer experience than Mr. Frederick Edwards, jun.; indeed, the suffix has been used so long, that as he now writes of parsons' grates it reminds one of another country parson, and suggests "the fatted calf was no ordinary calf, but one which had been in the family for many years." Mr. Edwards, jun., has had long experience, and in this, as in previous instances, he has given his readers the full benefit of it.

THE MAGAZINE OF ART.—The November number of this magazine commences a new series, which is in a large and handsome quarto form, which will form a suitable ornament for the library or drawing-room table, For cheapness the magazine is unsurpassed there being 48 pages for one shilling. In the present number, there is an effective etching by Lalauze, as a frontispiece, and numerous beautifully executed wood engravings in the body of the work; one—the "Republic," from Gautherin's bust, executed for the Prefecture of the Seine, and exhibited at the last Paris Salon—being alone worth more than the entire cost of the number. The change made will be generally appreciated.

GOLD AND SILVER TABLES.—A useful set of tables, showing the value of silver and gold per ounce troy at any degree of fineness, as well as tables of weight, tables for the calculation of assay values, &c., has just been published (New York: Mathey, Cüstel, and Riotte, Metallurgical Works, Washington-street), and will be found applicable to the repuirements of a large number of persons. The table of the value of silver is calculated from the basis upon which the value of silver is computed in the United States Mint and its branches—99 ozs. pure silver = $128. The gold table is calculated from the basis that 387 ozs. of pure gold (1000 fine) is worth $8000. There is a table for showing the relative values of avoirdupois and troy weight. There are various hints and suggestions, and the tables are altogether well worth a place in every laboratory and mine office.

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NEW RIVER COMPANY.—At the Auction Mart Messrs. Edwin Fox and Bousfield sold by auction parts of a King's share in the New River in lots which realised at the rate of 90,400*l.* per share. They also sold parts of an adventurer's share in the same company at the rate of 94,200*l.* per share, and several 100 shares paid up at 375*l.*

SOMETHING NEW.—The Plating Company of the Bishopton-lane Works, Stockton-on-Tees, are nickel-plating seven full sets of locomotive fittings for an English railway. These include the domes and safety-valve covers, which are polished by the patent polishing machine of Mr. Thomas Fenwick. Nickel plating as applied by this company is being extensively used for engines of every type and for almost every purpose.

THE WEST AFRICAN GOLD MINES.—Referring to a statement in the Daily News, to the effect that the "yield of gold" at the Wassaw Gold Mines "is very small in consequence of the want of suitable labour, the European constitution not being suitable for the climate, and native labour being too unreliable," Mr. F. Fitzgerald, the secretary of the Effuenta Gold Mines and Gold Coast Mining Companies, observes that the facts are not as there reported. Of the four companies' mines really being worked only in one—that of the "African Gold Coast Company"—has the gold lode been reached. There many hundred tons were already at bank in June last, worth 5*l.* 4*s.* per ton; and according to the further report of Mr. Verillon, the managing director, thirty tons a day could be sent up; and the company were not making returns of gold to England only because of accidents to their machinery. That company had above 200 African natives at work; the Effuenta, whose three drifts are approaching the gold lode, 117; the Gold Coast Mining, more recently formed, with one tunnel begun, about 50; the "Abosso," a sufficient supply; and labour had not at any time been inadequate or unreliable, although the native labour is of course very inferior when compared with that in colder climates. As regards "the Europeans," the climate is no doubt a very trying one, and attacks of fever are about as common (and not more dangerous) as those horrible colds in England from which so many of us are now suffering. Great care is no doubt necessary in Wassaw on the part of Europeans, of whom the "staff" of the several companies is composed; but fatal results are certainly not common, and, when they occur, may generally be attributed to carelessness or misconduct. Mr. Bonnal, who resided three years in Wassaw as manager of the African Gold Coast Company, lately informed me that, although they had 13 Europeans on their staff, only one death had occurred during the three years, and that was entirely owing to obstinate misconduct and brandy. We shall apparently have to look to "West Africa and the East Indies" for our future much-needed gold supply, and erroneous reports of an unfavourable nature from either cannot be too speedily contradicted.

THE VALUE OF IRONWORKS PROPERTY.—The Garth Anchor, Chain, and Ironworks which are situate at Taff's Well, near Cardiff, were offered for sale by auction by Messrs. Farebrother, Lye, and Palmer, on Friday. The works comprise several blocks of buildings, which are described as containing engines, boilers, fixed machinery, and plant, fixed tools, railways, canals, and basins. The works occupy 6a. 3r. 3p., and across the canal, which runs close to the works, is another piece of land measuring 1a. 2r., upon which are erected 40 substantial workmen's cottages, and adjoining the Walnut Tree Station, on the Taff Vale Railway; on another plot of 2½ acres is erected a detached residence with all the accessories suitable for a manager or principal. The property is leasehold from various property owners. It was put up in one lot by the auctioneer, who stated that reckoning interest at 7½ per cent., and without taking account of the machinery or goodwill, it was worth 16,000*l.*, but the works had cost 38,000*l.* to create. A bid of 4000*l.* was made for the property, and two advances of 1000*l.* were made. Two advance bids of 500*l.* were made, and when the property reached 7500*l.*, the auctioneer offered to take bids of 100*l.* The biddings, however, did not go on very freely, and when the sum offered reached 7800*l.* they stopped, and the property was withdrawn under the conditions of sale.—*South Wales Daily News.*

# Registration of New Companies.

The following joint stock companies have been duly registered:—

THE TANKERVILLE GREAT CONSOLS COMPANY (Limited).—Capital 110,000*l.*, in shares of 1*l.* To purchase or otherwise acquire mines, minerals, and metals of all kinds, including gold, silver, copper, tin, lead, blende, silver-lead, iron, coal, stone, slate, &c., in Great Britain, and to carry into effect certain agreements made between the Tankerville Mining Company (Limited) of the first part J. H. Murchison and H. J. Alfred of the second part, J. H. Murchison of the third part, and J. H. A. Smith of the fourth part. To carry on the different businesses and operations connected with mining interests. The subscribers (who take one share each) are—H. J. Nash, Fulham, accountant; W. Glasson, Islington, accountant; A. Kerly, 14, Great Winchester-street, solicitor; C. H. Smith, 43, Bayston-road, accountant; W. H. Lamb, Anerley, no occupation; J. Morpeth, Derwent Mines agent; C. Thomas, Camborne, agent. Each director is to receive as remuneration 100*l.* per annum, and he must hold in his own right 500 shares.

WOODLAND COLLIERIES COMPANY (Limited).—Capital 200,000*l.*, in shares of 100*l.* The purchasing or otherwise acquiring, winning, working, or developing the seams and beds of coal, fire-clay, and ironstone, situated in the county of Durham, and hitherto held by the Owners and Woodland Collieries and Fryer and Co., and any other properties, for the purpose of carrying on all business connected with that of a colliery proprietor and mine owner in all branches. The subscribers are—E. R. Whitwell, Darlington, colliery owner, 558; J. Fryer, Darlington, colliery owner, 490; A. Metcalfe, jun., Ravenstondale, colliery owner, 230; J. B. Dale, Darlington, colliery owner, 203; E. Hutchinson, Darlington, solicitor, 5; T. Shipley, Cookfield, viewer, 5; G. S. Byers, Darlington, accountant, 4. Messrs. Fryer, Whitwell, Metcalfe, and Dale are to be the first directors, the qualification being fixed at shares or stock to the value of 1000*l.*

PRIESTLY MILL COMPANY (Limited).—Capital 15,000*l.*, in shares of 20*l.* To carry on the manufacture and sale of clothes and woollen, cotton, alpaca, and mohair goods, at Pudsey. The subscribers are—J. Sharp, Pudsey, 6; W. A. Samson, Pudsey, 5; J. Webster, Annley, 10; J. Turner, Pudsey, 6; F. Muff, Pudsey, 12; J. Armitage, Pudsey, 10; E. Norton, Pudsey, 6.

THE EAST CANNOCK COLLIERY COMPANY (Limited).—Capital 50,000*l.*, in shares of 20*l.* The purchasing a lease of the East Cannock Colliery, situate at Hednesford, Staffordshire, together with the plant, machinery, stocks, and other effects belonging thereto, for the purpose of carrying on the business of miners, smelters, engineers, ironmasters, ironfounders, and brick and tile makers, and everything connected with a colliery company. The subscribers are—H. D. Pochin, Barnes, merchant, 200; C. Markham, Chesterfield, engineer, 200; D. Wyllie, 13, Leadenhall-street, merchant, 200; H. W. Gibson, Stafford, gentleman, 75; S. Stokes, Fairfield Great Bar, 200; H. Brace, Coalsall, merchant, 100; L. Winterbottom, Walsall, solicitor, 50. A director's qualification is 50 shares. The board consists of the following gentlemen:—Messrs. Pochin, Markham, Wyllie, Gibson, and Stokes.

THE WOOLPIT BRICK AND TILE COMPANY (Limited).—Capital 25,000*l.*, in shares of 5*l.* To carry on a brick and tile making business in Suffolk. The subscribers are—J. R. L'Amy, 107, Cromwell-road, 600; R. T. Turnbull, 5, East India-avenue, 300; T. D. Thomson, 57, Moorgate-street, 157; A. Duncan, Burgess Hill, 150; E. G. R. L'Amy, 107, Cromwell-road, 300; A. L. Don, Fountain-court, 200; J. N. Blyth, Highbury, 150.

THE COALVILLE BRICK AND TERRA-COTTA COMPANY (Limited).—Capital 10,000*l.*, in shares of 10*l.* To carry on a brickmaking and terra-cotta manufacturing business in Leicestershire. The subscribers (who take one share each) are—J. Fleming, Leicester; A. J. Archer, Coalville; A. B. Partridge, Leicester; J. G. Evatt, Leicester; J. H. Baker, Leicester; J. D. Wragg, Burton; J. Jones, Loughborough.

THE CAPITALISTS' ASSOCIATION (Limited).—Capital 100,000*l.*, in shares of 100*l.* Generally to carry on the business of capitalists, financiers, or merchants. The subscribers (who take one share each) are—B. A. McLean, 8, Old Jewry; W. Lawrence, 13, Copthall-court; J. Morris, 6, Old Jewry; E. Maguire, 3, King's Bench Walk; J. D. Ayers, Green Lanes; W. Morris, Blackheath; J. Cathcart, 9, Millman-street.

THE SOCIETY OF AFRICAN TRADERS (Limited).—Capital 15,000*l.*, in shares of 10*l.* and 5*l.* To carry on a general trading business with Africa. The subscribers (who take one share each) are—T. C. Watts, 101, Leadenhall-street; W. J. Mintz, 158, Vauxhall Bridge-road; H. G. Watts, 14, Fulham-place; H. J. Ford, Gipsy-road; W. H. Holloway, Walham Green; C. Watts, Paddington; F. J. Watts, 14, Fulham-place.

THE GLYN NEATH COLLIERIES (Limited).—Capital 15,000*l.*, in shares of 10*l.* To purchase the interest of J. U. Wing in a leasehold colliery and premises situate at Glyn Neath, Glamorganshire, and comprising 850 acres of seams of coal, together with all plant, machinery, implements, stock, goods, &c., and the searching for, getting, and making merchantable of coal and ironstone, the smelting or reduction of ores, and generally to carry on the business connected with a colliery company. The subscribers (who take one share each) are—T. R. Buks, Sheffield, wholesale grocer; J. U. Wing, Sheffield, accountant; G. Shaw, Sheffield, colliery proprietor; J. Harris, Rotherham, ironfounder; J. Hibbard, Sheffield, merchant; J. Hibbard, junior, Handsworth, coalowner; J. L. Buks, Sheffield, wholesale grocer. Mr. Geo. Shaw to be managing director and chairman. The qualification for each director is 25 shares.

WOKING AND HORSELL GASLIGHT AND COKE COMPANY (Limited).—Capital 15,000*l.*, in shares of 5*l.* To manufacture, supply, and sell gas and coke in Woking and Horsell. The subscribers are—G. B. Holroyd, Byfleet, 150; W. G. Gibbon, 158, Wool Exchange, 10; C. Wight, Woking, 5; J. Harris, Woking, 5; S. C. Knight, Woking, 5; F. Eggan, Woking, 20; J. P. Fitzgerald, Horsell, 20.

THE LINCOLN TRAMWAYS COMPANY (Limited).—Capital 20,000*l.*, in shares of 5*l.* To construct, maintain, and work tramways in Lincoln and elsewhere. The subscribers (who take one share each) are—W. Busby, Liverpool; J. Carson, Liverpool; D. Busby, Liverpool; G. Bainbridge, Lincoln; F. Clarke, Lincoln; E. Pratt, Lincoln; F. H. Goddard, Lincoln; H. Pratt, Lincoln.

THE KENSINGTON ADVANCE AND INVESTMENT COMPANY (Limited).—Capital 25,000*l.*, in shares of 1*l.* To carry on a financial advance and investment business. The subscribers are—F. E. Dowse, Shepherd's Bush, 25; J. Oakenden, Notting Hill, 25; T. R. Dowse, Shepherd's Rush, 25; T. Loveridge, 1, Warwick-road, 25; A. Witerpritz, Hammersmith, 25; R. Dines, Hammersmith, 5; E. Whitaker, Hammersmith, 10.

THE COWBURNE SAFETY VALVE COMPANY (Limited).—Capital 5000*l.*, in shares of 10*l.* To carry on the trade of safety valve manufacturers and engineers in the various branches. The subscribers (who take one share each) are—O. March, Rochdale; W. E. Robinson, Rochdale; T. Holt, Rochdale; W. A. Peters, Rochdale; E. Kershaw, Rochdale; J. L. Beach, Rochdale; E. Nun, Rochdale.

MIDDLEWICH SALT AND BRICKMAKING COMPANY (Limited).—Capital 20,000*l.*, in shares of 5*l.* To carry on the business of the making of salt, and the manufacture of bricks, tiles, &c. The subscribers are—J. Jackson, Norwich, 60; T. Capper, Norwich, 60; H. Hodskis, Middlewich, 20; J. Thompson, Norwich, 20; J. Ravenscroft, Knutsford, 20; T. E. Rigby, Manchester, 20; H. Hyde, Manchester, 20.

THE LAST CHANCE CONSOLIDATED SILVER MINING COMPANY (Limited).—Capital 100,000*l.*, in shares of 1*l.* To acquire certain freehold properties situate in Salt Lake county, Utah, known as the Last Chance, the Hooper, the Opulent, and the Silver Maid Mines, with all their rights, privileges, and appurtenances, and the plant and machinery thereon, and also all the property, assets, and effects of the Last Chance Silver Mining Company of Utah (Limited). To develope, open up, and work said or any other mines that may from time to time come into the possession of the company, and generally to carry on the business in all its branches of a mining company. The subscribers (who take one share each) are—W. Armstrong, Putney, merchant; H. Slaney, Blackheath, clerk; F. C. Holton, Penge, clerk; E. E. Scott, Lee, actuary; A. W. Wells, Highbury, accountant; C. Lubbock, Bermondsey, shorthand writer; E. Cook, Leyton, accountant. The subscribers to appoint the first directors, whose number must not exceed seven, or be less than two.

THE MEDITERRANEAN STEAM-SHIP COMPANY (Limited).—Capital 25,000*l.*, in shares of 50*l.* To carry on the business of a shipowner in all branches. The subscribers (who take one share each) are—E. G. Campbell, 8, Beaumont-terrace; R. W. B. Ivens, 82, Bishopsgate-street; G. H. Lord, Buckhurst Hill; M. C. L. Bozas, 1 and 2, Great Winchester-street; J. E. Howard, Tottenham; J. C. Cox, 25, Castle-street; J. W. Simpson, Camberwell.

THE DIEU-DONNE GOLD COMPANY (Limited).—Capital 50,000*l.*, in shares of 1*l.* To adopt and carry into effect an agreement made between J. W. Uloth and T. W. Martin for the purchase and acquisition of certain gold mines and mining rights situate in Surinam. To work the gold diggings, mines, and reefs, &c., upon or under the estates and properties of the company, and generally to carry on all operations and business of a gold mining company. The subscribers (who take one share each) are—W. Burr, 42, Poultry, actuary; H. S. Wilde, Bushey Heath, gentleman; A. R. Robinson, Ealing, engineer; H. Duncan, 1, Draper's Gardens, merchant; E. Schubert, 32, St. Swithin's-lane, accountant; T. W. Martin, 2, George-street, gentleman; R. E. Buck, South Norwood, accountant. Messrs. Wilde, Robinson, Duncan, and W. H. Saunders, are to be the first directors. The remuneration of the board is fixed at 600*l.*, and 10 per cent. of net annual profits.

RICHMOND STEAM LAUNDRY COMPANY (Limited).—Capital 6000*l.*, in shares of 10*l.* To carry on a laundry business in all its branches. The subscribers are—W. Reynolds, Richmond, 10; J. R. Summers, Richmond, 10; C. Davis, Lavender Hill, 10; J. Maxwell, Richmond, 10; F. J. Mann, Richmond, 5; R. Sparrow, Richmond, 1; J. Burford, Richmond, 10.

THE BOILER INSURANCE AND STEAM POWER COMPANY (Limited).—Capital 250,000*l.*, in shares of 5*l.* To acquire and continue the business of the Boiler Insurance Steam-Power Company (Limited). The subscribers (who take one share each) are—W. McNaught, Manchester; J. Haworth, Southport; H. Newall, Manchester; T. Vickers, Manchester; C. J. Galloway, Manchester; W. A. Turner, Pendleton; J. Scarlett, Manchester.

THE LONDON LAND COMPANY (Limited).—Capital 1,000,000*l.*, in shares of 25*l.* To carry on all operations connected with a land company. The subscribers (who take one share each) are—M. H. Synge, 22, Portland-terrace; G. H. Patham, 34, Essex-street; E. R. Gray, 9, Petersham-terrace; T. Harrison, 3, Fowke's Buildings; R. D. Wilin, 22, Stafford-terrace; W. C. Armstrong, 33, New Bridge-street; W. H. Smith-Aubrey, 138, Fleet-street.

GREENALL, WHITLEY, AND COMPANY (Limited).—Capital 700,000*l.*, in shares of 1000*l.* To carry on the trades of brewers, malsters, and spirit and wine merchants.

THE DEVALAH-CENTRAL GOLD MINES COMPANY (Limited.)—Capital 120,000*l.*, in shares of 1*l.* To acquire and develope certain leasehold estates belonging to Messrs. Parry and Co., Madras, known as the Hamslade, Hamsluck, Adelphi, and Nadovgany estates, situate in Wynaad, Presidency of Madras, together with all the mining rights of said estates, and any others. To work all mines and quarries, ores, coal and other minerals, belonging to the company, and to smelt, heat, manufacture and sell all products, and generally to carry on the business of a gold mining company in all branches. The subscribers are—A. F. Brown, 53, Gloster-terrace, merchant, 500; R. Fowler, 3, Victoria-street, solicitor, 50; J. Shaw, 48, Bedford-row, solicitor, 50; S. C. Probyn, 23, Thurloe-square, gentleman, 250; T. Rond, 17, Delahey-street, gentleman, 10; E. H. Wood, 3, St. George's-square, civil engineer, 10; E. Wood, 45, Onslow-gardens, civil engineer, 20. The directors' qualification is paid at 200 shares. Remuneration two guineas and four guineas to the Chairman for attendance.

THE HYNDBURN MILL MANUFACTURING COMPANY (Limited.)—Capital 12,000*l.*, in shares of 300*l.* To carry on the business of spinning, weaving, and otherwise dealling with cotton, yarn, cloth, &c. The subscribers (who take one share each) are—R. Bertwistle, Great Harwood; J. Dearden, Great Harwood; R. Haworth, Great Harwood; W. Parkinson, Clayton-le-Moors; A. K. Merar, Great Harwood; J. Shepherd, Great Harwood; W. Ratcliffe, Great Harwood.

THE WOLVERHAMPTON VICTUALLERS' BREWERY COMPANY (Limited)—Capital 10,000 in shares of 10*l.* To carry on a brewery business. The subscribers are—J. C. Smith, Wolverhampton, 10; J. Berry, Wolverhampton, 10; G. J. Scarlett, Wolverhampton, 5; S. Wright, Wolverhampton, 10; A. Tudor, Wolverhampton, 10; L. Lewis, Wolverhampton, 10; J. Dodd, Wolverhampton, 5.

THE PYLE WORKS (Limited).—Capital 100,000*l.*, in shares of 10*l.* To acquire land and premises in Glamorgan for the purpose of carrying on the business of an iron and steel company. The subscribers (who take one share each) are—J. Hicks, 18, Laurence Pountney-lane; H. Kemp, Cricklewood; F. H. Cheesewright, 129, Gloster-road; H. W. Soutter, New Barnet; H. J. Higgs, 10, Cornhill; C. E. Moore, Peckham; A. Child, 14, Cleveland-road.

FINE ARTS' ALLIANCE CO-OPERATIVE SOCIETY (Limited).—Capital 100,000*l.*, in shares of 1*l.* To carry on the business of general dealers and the buying and selling of works of art and other articles. The subscribers (who take one share each) are—R. N. Dunning, 170, St. John-street; J. H. Smith, London Hall; J. P. Hance, Borough; W. Monday, New Wandsworth; T. H. Fletcher, Clapham; E. T. Hollins, 2, Tynes-street; N. H. Cook, Holloway.

CONSTANTINOPLE DOCKING AND REPAIRING COMPANY (Limited).—Capital 120,000*l.*, in shares of 10*l.* The constructing and establishing floating or other docks, and carrying on the business of dock and ship contractors and owners. The subscribers (who take five shares each) are—W. J. Alb, 14, Queen Victoria-street; G. Elliot, 6, Cathcart-road; T. D. Rock, 46, Leadenhall-street; G. Badham, 3, Saltors' Hall-court; M. Wilkin, 2, St. James's-terrace; C. A. Allen, 2, Cushion-court; F. W. Brown, 41, Devonshire-place.

WOOLWICH AND SOUTH-EAST LONDON TRAMWAYS COMPANY (Limited).—Capital 60,000*l.*, in shares of 5*l.* To lay down, construct, and work tramways in Woolwich and neighbourhood. The subscribers (who take one share each) are—H. Corbett, 16, Cornwall-road; J. Hardcastle, 7, North-bank; J. R. Jolly, Plumstead; C. Copland, Plumstead; T. Lloyd, 5, Westminster-chambers; B. P. Daniels, 7, Poultry; A. W. Good, 7, Poultry.

MEAD, CORNEY, AND COMPANY (Limited).—Capital 10,000*l.*, in shares of 100*l.* To carry on the business of printers, newspaper publishers, &c. The subscribers (who take one share each) are—J. Marwood, Liverpool; M. Corney, Liverpool; E. A. Corney, Liverpool; C. T. Mead, Liverpool; F. W. Corney, Liverpool; T. Marwood, Liverpool.

THE CUMBERLAND ROAD METAL COMPANY (Limited).—Capital 30,000*l.*, in shares of 10*l.* To acquire, open, and develope certain property in Cumberland, and to carry on the business of quarrying in all branches. The subscribers (who take one share each) are—T. Allison, Guisbrough; M. Bullen, Barnard Castle; W. Green, Middlesborough; H. Harkewitz, Middlesborough; A. Hallam, Middlesborough; C. Jackson, Saltburn-by-the-Sea; C. Moses, North Ormesby.

LONDON ARTISANS' LABOURERS' DWELLINGS COMPANY (Limited).—Capital 70,000*l.*, in shares of 5*l.* To assist and co-operate with the Metropolitan Board of Works in carrying into effect their schemes. The subscribers (who take one share each) are—W. A. M. Barnard, 28, Martin's-lane; T. E. Heller, Clapham; J. K. Malcolmson, 11, King William-street; R. O'Mahony, Army and Navy Club; R. B. Resker, 80, Cumberland-road; W. Hazell, 2, Dowgate-hill; B. Wood, 5, Water-lane.

DAVID HOWARTH AND COMPANY (Limited).—Capital 25,000*l.*, in shares of 50*l.* To acquire and continue the business of engineers, machinists, and makers of boilers, engines, &c., at Rochdale. The subscribers (who take one share each) are—D. Howarth, Rochdale; W. Howarth, Roohdale; J. Hoyle, Rochdale; L. Collier, Rochdale; J. Stundring, Rochdale; W. A. Peters, Roohdale; J. Howarth, Rochdale.

THE FRESH MEAT IMPORTATION COMPANY (Limited).—Capital 300,000*l.*, in shares of 10*l.* To carry on a meat importing business from Australia for the supply of the home markets. The subscribers (who take 25 shares each) are—Sir R. R. Torrens, 12, Chester-place; H. C. M'Donald, 116, Fenchurch-street; P. Bird, 16, Hyde Park-place; S. Bird, 44, Belsize Park Gardens; F. Newman, Woodberry Downs; T. Salt, 85, St. George's-square; H. W. Sandeman, South Norwood.

THE UNITED SHIPPING AND SHIP STORE COMPANY (Limited).—Capital 100,000*l.*, in shares of 10*l.* To carry on the business of general ship store and provision merchants. The subscribers (who take one share each) are—T. F. Field, Bow; E. Collard, Southwark; W. Powell, 12, Cooper's-row; E. B. Graham, 1, Great Winchester-street; J. C. Goldsmith, 5, America-square; W. St. John, Watford; W. Nicholson, 28, Leadenhall-street.

THE UNITED ASBESTOS COMPANY (Limited).—Capital 200,000*l.*, in shares of 10*l.* To acquire the undertakings of the Italo-English Pure Asbestos Company (Limited), at Turin and elsewhere, and of Messrs. Furse Brothers and Co., at Rome and elsewhere; also of the Patent Asbestos Manufacturing Company (Limited), at Glasgow and elsewhere, together with the mines, concessions, plant, machinery, business and property of the said companies and firm, on the terms of a certain agreement; to carry on the business so acquired, and that of miners and workers, purchasers and sellers of asbestos and other minerals or substances, manufacturing and dealing in the same. The subscribers are—C. Morrison, 53, Coleman-street, no occupation, 1000; J. Morris, 6, Old Jewry, solicitor, 100; W. C. Quilter, 14, King's Arms-yard, stockbroker, 100; D. Cargill, Glasgow, merchant, 100; J. H. J. Baillie, 15, Old Bond-street, no occupation, 100; E. Gellatly, 100, Leadenhall-street, shipbroker, 100.

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NEWCASTLE-ON-TYNE PUBLIC LIBRARIES.—One of probably the most nearly perfect and exhaustive catalogues of which any library can boast has just been completed by Mr. W. J. Haggerston, the chief librarian, and will certainly render the 20,000 volumes of the Central Lending Department, to which it relates, infinitely more valuable to a large number of persons. The catalogue is so skilfully arranged that no matter how slight the reader's knowledge of the authorities he wishes to consult, the catalogue will readily guide him to them. The author's name, the subject title, and in many cases almost an abstract of the book is given, so that more could not be required.

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GOLD IN NEW SOUTH WALES—THE TEMORA GOLD FIELD.—An interesting report upon this gold field has been made by Mr. Lamont Young, geological surveyor, to the Minister for Mines. The township of Temora is situated in the parish of Bundawarrah, county of Bland, and between the Trigalong and Narraburra Creeks, the first named lying two miles to the west, and the second five miles to the east. These creeks are merely depressions in the alluvial surface of the country, and trees grow in the deepest portion of their channels; at times, however, the banks are well defined, and the erection of a small dam will throw the water back a considerable distance. The principal geological formations in the district are Silurian slates and conglomerates. Near the Temora sheep station these rest against granite, and at the township itself against a long hill of diorite (or greenstone), running north and south, and adjoining the auriferous alluvial on the east. To the north-east, east, and south-east of the diorite is a belt of altered rocks; and, beyond these, the slate formation. The auriferous alluvial at Temora fills a deep and narrow valley, draining between the slates and the diorite in a northerly direction. In both these formations there are numerous quartz reefs, but gold has only been found in those occurring in the diorite. Reefs also occur in the altered rocks to the eastward, and one or two of them have been reported gold-bearing. The length of the lead known to be auriferous may be set down as 2¼ miles. Its character, so far as it has been proved, shows that the gold is chiefly coarse, and irregularly distributed; also, that it is of a light colour, and as a rule very little waterworn. From such tests as have been applied, and by comparing the local conditions with those of other and similar gold fields, such as Gulgong, Forbes, &c., it may be anticipated that the alluvial deposits (so far discovered) of Temora will be worked out in about five years; and that as a reefing district, it will furnish employment to miners for a considerable longer period.

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## COPPER ORES.

Sampled Oct. 20, and sold at Tabb's Hotel, Redruth, Nov. 4.

| Mines. | Tons. | Price. | Mines. | Tons. | Price. |
|---|---|---|---|---|---|
| Mellanear | 79 | £4 1 6 | East Pool | 76 | £2 1 |
| ditto | 78 | 3 14 6 | ditto | 63 | 2 5 |
| ditto | 77 | 3 12 0 | ditto | 56 | 1 19 |
| ditto | 69 | 3 8 0 | ditto | 35 | 1 9 |
| ditto | 68 | 2 14 6 | West Tolgus | 68 | 5 11 |
| ditto | 65 | 1 18 0 | ditto | 64 | 5 19 |
| ditto | 62 | 3 17 6 | ditto | 63 | 4 13 |
| ditto | 57 | 2 16 0 | ditto | 56 | 4 13 |
| ditto | 55 | 2 14 6 | Botallack | 49 | 6 5 |
| ditto | 25 | 9 15 6 | ditto | 1 | 22 0 |
| East Pool | 83 | 3 3 6 | Grt. Crinnis & Carlyon | 32 | 5 4 |

TOTAL PRODUCE.

| | | | | | |
|---|---|---|---|---|---|
| Mellanear | 635 | £2227 3 6 | Bottallack | 50 | £ 329 9 |
| East Pool | 313 | 722 12 0 | Great Crinnis, &c. | 32 | 164 16 |
| West Tolgus | 251 | 1314 17 0 | | | |

Average standard ... £ 90 14 0 | Average produce ... 7
Average price per ton ... £3 14 6
Quantity of ore ... 1281 tons | Quantity of fine copper, 91 tons 6 cwts.
Amount of money ... £4758 18 0
LAST SALE.—Average standard ... £ 93 11 0 | Average produce ... 8
Standard of corresponding sale last month, £ 84 1 0 | Produce, 8¼

COMPANIES BY WHOM THE ORES WERE PURCHASED.

| Names. | Tons. | Amount. |
|---|---|---|
| Vivian and Sons | 203 | £ 719 3 0 |
| Grenfell and Sons | 307 | 1237 14 0 |
| Nevill, Druce, and Co. | 264 | 1039 15 0 |
| Williams, Foster, and Co. | 179 | 772 16 6 |
| Charles Lambert and Co. | 328 | 989 9 6 |
| Total | 1281 | £ 4758 18 0 |

NO SALE on Thursday last, November 11.

Copper Ores for sale on Thursday next, at the Royal Hotel, Truro—Mines and parcels.—Devon Great Consols 849—South Caradon 430—Gunnislake (Clitters) 384—South Devon United 300—Marke Valley 200—Bedford United 105—Phoenix 40—Cotehill Consols 6—Total, 2314 tons.

## COPPER ORES.

Sampled Oct. 27, and sold at Swansea, Nov. 9.

| Mines. | Tons. | Produce. | Price. | Mines. | Tons. | Produce | Price. |
|---|---|---|---|---|---|---|---|
| Betts Cove | 82 | 8¾ | £4 12 6 | Virneberg | 9 | 23¾ | £13 14 |
| ditto | 82 | 8¼ | 4 13 6 | ditto | 45 | 14½ | 8 12 |
| ditto | 82 | 8½ | 4 12 6 | ditto | 70 | 10½ | 6 4 |
| ditto | 80 | 8½ | 4 13 6 | ditto | 15 | 6½ | 3 15 |
| ditto | 100 | 7¾ | 4 1 6 | Copper Ore | 38 | 5¾ | 3 0 |
| ditto | 100 | 7¾ | 4 1 6 | ditto | 2 | 5¼ | 2 5 |
| ditto | 100 | 7¾ | 4 2 6 | ditto | 2 | 8 | 4 1 |
| ditto | 100 | 7¼ | 4 3 0 | ditto | 6 | 10½ | 5 12 |
| ditto | 100 | 7½ | 4 3 0 | ditto | 17 | 18½ | 10 4 |
| ditto | 67 | 18¾ | 10 10 0 | ditto | 8 | 18½ | 10 15 |
| ditto | 19 | 20½ | 11 8 0 | ditto | 19 | 18½ | 10 0 |
| Union Ore | 70 | 10 | 5 10 0 | ditto | 19 | 3 | 0 16 |
| ditto | 69 | 10¼ | 5 10 6 | Burnt Ore | 71 | 2¾ | 1 11 |
| ditto | 69 | 10¼ | 5 11 0 | Cambrian | 18 | 18¼ | 10 11 |
| ditto | 69 | 10½ | 5 11 6 | ditto | 15 | 13¾ | 8 5 |
| ditto | 44 | 7¾ | 4 4 0 | ditto | 18 | 4¾ | 2 19 |
| ditto | 20 | 9½ | 5 0 0 | ditto | 18 | 13¾ | 7 14 |
| Caveira Ore | 90 | 7¾ | 3 14 6 | Italian Ore | 19 | 13¾ | 7 11 |
| ditto | 90 | 7¾ | 3 15 6 | ditto | 14 | 13¼ | 7 1 |
| ditto | 90 | 6¾ | 3 13 0 | Bugalho Ore | 32 | 23½ | 14 1 |

TOTAL PRODUCE.

| | | | | | |
|---|---|---|---|---|---|
| Betts Cove Ore | 812 | £4078 9 0 | Burnt Ore | 71 | £ 58 11 |
| Union Ore | 341 | 1818 13 0 | Cambrian Ore | 51 | 266 15 |
| Caveira Ore | 270 | 1003 10 0 | Italian Ore | 33 | 252 9 |
| Virneberg Ore | 139 | 1000 11 0 | Bugalho Ore | 32 | 449 12 |
| Copper Ore | 90 | 588 11 6 | | | |

COMPANIES BY WHOM THE ORES WERE PURCHASED.

| Names. | Tons. | Amount. |
|---|---|---|
| Copper Miners' Company | 312 | £ 1,489 10 6 |
| P. Grenfell and Sons | 73 | 63 1 6 |
| Nevill, Druce, and Co. | 28 | 210 4 0 |
| Vivian and Sons | 52 | 331 10 0 |
| Williams, Foster, and Co. | 568 | 2,638 4 0 |
| Mason and Elkington | 45 | 164 5 0 |
| Charles Lambert and Co. | 604½ | 3,359 0 0 |
| Landore Copper Company | 156½ | 1,361 7 6 |
| Total | 1839 | £ 9,617 2 6 |

NO SALE November 23.

TOTALS AND AVERAGES.

| | 21 cwts. | Produce. | Price. | Per unit. | Standard |
|---|---|---|---|---|---|
| Whole sale ... | 1839 | 9½ | £5 4 7 | 11s. 0d. | £79 13 10 |

## FOREIGN MINES.

LA PLATA MINING AND SMELTING (Leadville).—Telegram received on Nov. 9: October net profit, $15,162 88 c. Have contracted for the whole output of the Robert E. Lee Mine for the next three months.—Letter dated Leadville, Oct. 24: The La Plata Mines are exceeding expectations. Our daily receipts from the mine at our smeltings are from 30 to 35 tons. We have bought, and are now putting in with all possible speed, a steam holster, with the aid of which the output will be whatever we may require at our smelters, even if up to 100 tons daily.—Week ended Oct. 23: Ore purchased, 539 tons; ore smelted, 732 tons; silver produced, 24,434 ozs.; lead produced, 100 tons; bullion shipped, 106 tons.

RUBY AND DUNDERBERG CONSOLIDATED.—Report on the above mines for the week ending Oct. 17: Main Shaft: Timbering and guides completed to the 600 ft. level. We are now engaged in cutting out the station, and expect to resume sinking about Nov. 1. The 600 ft. level has advanced 27 ft.; now 77 ft. No change in the north winze below the 500 ft. level; it has advanced 13 ft. this week; now 92 ft. At the winze at south stopes sinking has been resumed; the ore is of good quality, and from 2 to 3 ft. wide. The 500 south has advanced 20 ft.; total 100 ft., and expect to make connection with the winze above and east of the 500 during the ensuing week. At the rise above the 400 a drift has been commenced, and continued 12 ft. in ore from 2 to 3 ft. wide; this place looks very favourable for opening out into a good ore body. The 300 west cross-cut has advanced 11 ft.; total, 273 ft. from the north drift from old incline; the ground looks more favourable for ore. At the upraise above the 300 the ore body is about 4 ft. wide, and looks very promising, but the ore is of rather lower grade at present. The machinery is all in good working order Have shipped 53 tons of ore during the week, and have 43 men at work and 5 tributers.

Telegram received from Eureka on Nov. 9: The quantity of ore extracted during the week was 90 tons.

COPIAPO.—T. B. Hall, Sept. 25: Dulcinea Mine: I am glad you approve of my determination to sink Fletcher's shaft with greater energy; this will be done much more satisfactorily below the 180 than previously performed. Fletcher's shaft is looking better, and the 160 north is decidedly improved; we have at present a magnificent lode in the 170 end south. The anniversary of this country's separation from the Spanish Government has been celebrated this week. Their festivities as usual have impeded all kinds of work, and will naturally make a difference in this month's production; however, I hope that the difference will not be much, as we shall use our best endeavours to make up the lost time. You will have observed that our production for the past two or three months has been considerable increased, and that our expenditure has not increased at the same ratio. This has been brought about by opening up the mine properly; for example, we are at present stoping more ground with 15 men than was done formerly with 32 at precisely the same points, and consequently use less powder, steel, and other materials, and save the rations of the men. Checo Copper and Silver Mines continue to be very poor; we were not disappointed in finding the lodes we went in search of, but much disappointed to find them unproductive. I do not despair, however, in hoping that we shall continue to pay cost, or even to make a small profit, for some time to come. Remittance of 1102l. 4s. 8d. has been received by this mail.

JAVALI.—Extract from manager's letter, Oct. 6: Mine: 49 varas were driven in the mine. The chief part of the quartz passed through the mill was extracted by our day labourers from the mine and manto workings. We still continue the workings under the Nispero; as yet no rich quartz has been met with, but the ground gives very excellent prospects. I feel very pleased to be able to tell you that from all the different places at which we are at present working the quartz has greatly improved in quality. Unfortunately on many parts we are still obliged to take away a lot of dead ground to arrive at the lode, but then when we do come to the quartz it generally fully repays the trouble. This chiefly happens at the Nespero surface working, where we have now a very large excavation, and as on either sides the banks are of clay we continually have landslips caused by the many heavy rains.

Mill and Remittance: I was able to work 27 stamps 21¼ days, which crushed 160 tons of quartz, giving a yield of 458½ ozs. of gold, an average of 4 dwts. 22 grs. per ton. It is my very disagreeable duty to give you particulars of a very serious accident which happened to our dam. All through the month the rain had been exceedingly heavy, but on the night of the 30th the fall was the greatest I have ever seen—3·41 in. by rain guage. At 5 a.m. on the 1st inst. our mill stopped for want of water, and upon going to ascertain the cause, we discovered an opening in the bank of the dam 19 varas wide, which took away the whole of the stream, not allowing any water to go down to the mill. I immediately set to work to repair, but the force of water was so great that we could only make a commencement by digging a large waste course, and thus part the stream, and enable us to dam up the leakage.

Up to this moment we have not been to stop the floor of water, and I very much fear that at least a third part of the month will go before we shall have water for the mill, if not more; to make matters worse it keeps on raining, and only by offering the men extra pay can I keep them at work. We have over 50 men on the spot. You will have some idea of the extent of the breakage when I tell you 250 sacks of sand have been placed across, and yet the top row is hardly to be seen. I can assure you I feel very disheartened at this expense and loss of time, especially as I had great expectations of being able to send you a still better remittance by the November mail; as it is there are no hopes of this, but on the contrary the expenditure will be so much greater?—Tailings Mill: In this mill we treated 200 tons of tailings, which yielded 47 ozs. of gold, making an average of 4 dwts. 16 grs. per ton. As salt is now slightly cheaper I have again taken up the plan of putting some into the pan, and find it answers exceedingly well, giving a better result and cleaner amalgam.—Receipts and expenditure: The expenditure was 839l. 4s., the remittance of gold is valued at 1200l., thus leaving a balance profit of 360l. 15s. 7d.

VIRNEBERG (Copper).—R. K. Roskilley, Nov. 3: Setting Report: Hadley Engine-Shaft: The 160 cross-cut is driven east of shaft 21 metres 60 cm., and during the last month it has been extended 7·60 metres; in this drivage several branches, composed of quartz disseminated with spots of copper ore, have been passed through, which in depth will unite with the main lode. In the forebreast we yesterday struck apparently upon a large lode, with beautiful quartz and copper ore intermixed, but we are not sufficiently through it to enable us to say whether it is the lode which in the levels above proved so productive; I hope, however, in my next to be able to inform you that it is the lode from which we have made, and still are making, our returns of copper ore; set to seven men, at 85 marks per metre. To stope the back of the 140 metre level, south of shaft, to four men, at 14 marks per metre; the lode is worth 4l. per fm. To stope the back of ditto, south of shaft, to six men, at 25 marks per metre; the lode is worth 7l. per fathom. To stope the back of the 140, north of cross-cut and south of shaft, to 16 marks per metre; the lode here has fallen off a little in value, and is now worth 10l. per fathom. To stope the back of the 140, north of rise, to six men, at 15 marks per metre; the lode is not looking quite as well as when last reported—worth only 9l. per fathom. In the back of this level and on the hanging-wall the lode is improved, and worth 8l. per fm.; set to six men, at 13 marks per metre.

In the 120 stopes to stope the back of the 120 metre level, south of shaft, to eight men, at 15 marks per metre; the lode is worth 12l. per fathom, and improving. To stope the back of ditto, south of shaft, to six men, at 16 marks per metre; the lode here is also worth 12l. per fathom. The Rhinecraft arrived at Mühlenweg for loading the copper ore on the 22nd ult., but the shipment was greatly retarded in consequence of the sudden rise of the Rhine—12 ft. in 24 hours—and, therefore, we only finished shipping the ore last Saturday, under great difficulty. This was caused by the recent heavy rains and the overflow of the Rivers Neckar, Mosel, and Ahr, as well as the Upper Rhine. The boat left Mühlenweg on Saturday for Mehlem, where she is now lying under shelter waiting for a sufficient fall of the river so as to sail for Rotterdam. It is possible it may be able to sail to-morrow or Friday. The dressing of ore is continued with a view to making another shipment before the approaching holidays, and towards which we have already a fair quantity prepared. Should the season prove mild, and we are not visited with such severity of weather as we experienced in the past three winters this will be readily accomplished.

*** The following Foreign Mine Reports were unfortunately crowded out of last week's Journal:—

ALMADA AND TIRITO CONSOLIDATED.—Telegram from Mr. J. H. Clemes, dated Oct. 10: I have remitted you bullion (Wederspoon), $4000.

RICHMOND CONSOLIDATED.—Telegram from the mine at Eureka, Nevada: Week's run, $55,000, from 1000 tons of ore. Refinery, $50,000.

—R. Rickard, Oct. 13: I beg to hand you a report of the different operations for the past week. Lizette Tunnel cross-cut has been extended 22 ft. The ground is more favourable for drifting. The 500, north from No. 14 chamber, has been advanced 17 ft. in favourable ground. The 600, north from No, 14 chute, has been drifted 26 ft. in the same character of ground. The 600 main west drift has been advanced 24 ft., without any change to mention. The 600 south, on fissure, has been advanced 10 ft., in good ground The 600, south from west drift, has been extended 23 ft.—ground favourable for drifting. The 700, west from shaft, has been drifted 7 ft. in hard ground. The 700, north-west from winze, has been advanced 30 ft. in favourable ground for drifting. The 800 north, on fissure, has been extended 10 ft.; the fissure is regular, and the ground looks favourable for ore. The 800 west has been advanced 12 ft. in had limestone. The 900 north cross-cut has been drifted 2 ft.; work in this has been suspended for the time being. The 900 north-west, on fissure, has been extended 25 ft.; the ground is not quite so favourable as it has been. We have begun to cut out a plat preparatory to the sinking of a winze on the fissure, at which point it looks very favourable for ore. The chambers are without any change to mention. They are looking well, and turning out the usual quantity of ore.

EBERHARDT AND AURORA.—Telegram from Capt. Drake, Nov. 5.—Report forwarded 30th; "Raise 55 feet in very favourabled rock, silicious lime and quartz. Advise, continuing work. Prospects good."

PITANGUI (Gold).—Mr. T. S. Treloar, Pitangui, Oct. 2: Mr. Treloar reports that there was no improvement in the produce for the second half of September, which amounted to but 246 oitavas of gold, derived as follows:—102 oitavas from 230 tons of general mineral, and 144 oitavas from 2 tons of veinstuff; the latter being obtained from Francisco Antonio vein, no veinstuff having been taken from the Ouro Podre vein. Since Sept. 23 operations on the last named vein had again been suspended, owing to the presence of water in the bottom, and sinking cannot be resumed until the side level at the 30 is in sufficiently far to drain the footwall of the vein, for it was too soft to support timber. When left, the Ouro Podre vein was still much disordered by ironstone; but a decided improvement was visible in the last samples taken, and Mr. Treloar was in hopes that another bunch of gold was not far distant. Holland's shaft had been reopened to bottom without meeting water, and the Francisco Antonio vein found; but expectations regarding it had not, so far, been realised, the vein being only moderately rich, and small—its size not exceeding from 4 to 6 in. There is, however, around it good generul mineral for the stamps, which will, no doubt, turn out well. At its present depth of 26 fms. from surface this vein is not rich enough to warrant the prosecution of further operations upon it until this part of the mine is connected with the lower by the 15 fm. level, so as to facilitate the discharge of mineral. The sinking offlarge shafts had accordingly been suspended, the small footway shaft alongside continuing to be sunk, with a view, when under the old workings, with which both shafts are still surrounded, of driving off therefrom to intersect the other veins, in order that when they commenced raising gold in this part of the mine they may have more than one vein to depend upon. The 15 fm. level was progressing well, and might be expected to reach the neighbourhood of these upper veins about the end of December, provided the ground continued favourable. There was nothing calling for special remark in the Bahu section. Auriferous samples continued to be taken daily, but no mineral had yet been met with suitable for treatment. [A rise, which was almost completed, was being put up to surface for ventilation; and from this rise exploratory cross-cuts would be driven immediately under the old workings to the points where, it is said, the veins were left rich. The surface works were progressing satisfactorily.

NEW GOLD RUN.—F. M. Chadbourn, Oct. 12: The mill has been running continually since starting, with the exception of one mortar (five stamps), which we were obliged to stop for a few days owing to the breaking of the lining, but everything is now working all right. We have crushed about 800 tons, but about 300 tons of this was cement that had caved down from the top, and which we had to mill in order to clean the bed-rock; but I hardly think it rich enough to mill. It will, probably, bring down the average. We are cleaning bed-rock as fast as possible, but most of it has already been cleaned. In the last run that Mr. stone made, on the bottom he obtained from the crevices over $1000 in coarse gold, and in every run he took off more or less, so that we do not get the full cleanings of the bed-rock. We are extending tunnel night and day, and I think we are now nearly through the broken bank, which we have had to timber strongly. I think we shall only have enough water to make this run to about the end of the month unless we have some early rains.

RUBY AND DUNDERBERG CONSOLIDATED.—Report on the above mines for the week ending Oct. 10: The 600 ft. level has advanced 35 ft. this week; total, 50 ft. We have completed timbering the shaft all but to putting in the guides, and as soon as these are in place and the station cut sinking will be resumed. The north winze below the 500 has been sunk 24 ft.; a small seam of good ore, about 6 in. wide, has been encountered. At the winze at the south stopes no sinking has been done this week, but we have drifted 12 ft. in ore from 2 to 3 ft. wide. The 500 south has advanced 22 ft.: total distance, 70 ft. The ore in the winze at the end of the drift, above and east of the 500, continues to improve, but owing to the want of ventilation work will have to be discontinued here until the 500 south drift be connected with it. The rise above the 400 has considerably improved, and looks very favourable. The 300 west cross-cut, commenced at a point 275 ft. north from the old incline on the 300 ft. level, has advanced 10 ft. this week: total distance in a westerly direction 262 ft. from the level, and I estimate that when we drift another 100 ft. we will then be far enough west, but may have to drift some distance southerly to get under the Home Ticket shaft. We have 43 men at work and 5 tributers, and have shipped 42 tons of ore.

— Telegram received from Eureka on Nov. 2—The total quantity of ore extracted during the week was 91 tons.——N.B. No ore smelted, in accordance with previous advices.

REPUBLICAN MOUNTAIN SILVER MINES—Mr. G. M. Henty, F.G.S., superintendent of the mine, reports—A rich vein has been struck, which promises to open into a large ore body. Will you report on this at earliest convenience. From the Edward Everett tunnel the following has been sold:—756 lbs. No. 1 class ore, 10 sacks, assay 379 ozs. per ton, price $334·81 per ton; 1690 lbs. No. 2 class ore, 27 sacks, assay 162 ozs. per ton, price $127·23 per ton.

INDIAN GLENROOK.—Extract from Mr. R. C. Syson's letter, dated Glenrock Estate, Devalah, Oct. 11: "I beg ro report that the No. 3 tunnel is now in 50 ft., and that from to-day it will be kept going night and day. No. 1 tunnel is still in hard rock, and the progress there is consequently slow, as blasting has frequently to be done. This week I purpose starting a prospecting tunnel near the pulping house for the purpose of proving Nos. 1 and 3 reefs at a much lower level, and where the facilities for working the reefs, should the tunnnel prove successful, are very considerable."

SOUTH INDIAN (Gold).—Capt. Gifford, Oct. 11: During the past two weeks rapid progress has been made in all points of operation. In No. 2 tunnel we are driving both east and west on course of the reef. In the former the reef is full 7 ft. wide, of a promising appearance. In a few cases of testing the quartz I found free gold, but not in large quantities. In driving west, the reef is 8 ft. wide, and is somewhat of a different character to the east, having more pyrites intermixed throughout the whole width of the reef. The No. 4 tunnel, which is on the lowest point of the Mangoe range, is now driven 57 ft., and I am of a strong opinion we are near the hanging (or high) wall of No. 1 reef, which we are working on in No. 2 tunnel; on this I hope to advise you more fully next mail. The No. 3 tunnel, which is being driven to prove the northern parts of Mangoe range, is now in 158 ft., and near the present end we have passed through a vein of quartz and pyrites 1 ft. thick (or wide), and in testing the same gave a slight show of free gold. This branch or vein is dipping northerly, which, in my opinion, is making fast into a masterly reef. As before stated, all points of operation are progressing satisfactorily, labour being abundant.

LA PLATA MINING AND SMELTING (Leadville).—Statement for the week ending Oct. 16:—Ore received at works, 418 tons; smelted during week, 733 tons; yield in silver, 46,280 ozs.; ditto in lead, 141 tons; bullion shipped, 149 tons.

COLORADO UNITED.—Mr. W. Fraser Rae, one of the directors of the company, who is on a visit to the property, has sent the following cable from Georgetown, Colorado, to the Chairman:—"Highly satisfactory; prospects bright."—RAE.

ISABELLE (Gold and Silver).—Extract of letter from Mr. Lewis Chalmers, dated Oct. 11:—I enclose foreman's report for the last week, and confirm what he says about bad drilling rock and water. When in the tunnel yesterday afternoon water was literally gushing from the face and sides. I hope to be in ledge matter soon. The Balaclava lode showed itself, but was all broken up by more recent formation where we crossed it. A Diamond drill would probably find pay ore. You will see from the enclosed cutting from the Chronicle of Oct. 6 that Sutro's laterals (much smaller than our Tunnel) are costing $70 per ft.—— Foreman's report for week ending Oct. 9: Advance made, 50 ft.; total distance from mouth, 3963 ft.; total distance from Monument, 4035 ft. The formation has been very hard, with considerable water, causing the loss of five shots.

COPIAPO.—T. B, Hall, Sept. 13: Dulcinea Mine; Fletcher's shaft slow progression has been made at this point during the past month, on account of the state of the skip-road, which required general repairs, and the badness of the footwall of our shaft, which owing to the water has become weakened, and requires to be thoroughly secured before we can place our shaftmen again to continue their sinking with safety; I shall then re-set it to three men, at $50 per metre; the lode is about the same as in my last report, being 2 ft. wide, and yielding 2 tons of ore per fathom; we sank during the past month 50 metres. The 170 to drive north of shaft; set to two men, at $30 per metre; driven last month 3·20 metres. The lode here has improved a great deal in appearance during the past month, being now worth about 1 ton of ore per fathom, and I am convinced that we shall still have a further improvement. The 170 south is set to three men, at $30 per metre; the lode is 4 ft. wide, and yields 4 tons of ore per fathom; driven on this lode during the past month 3·60 metres. The winze sinking below this level is set to three men, at $30 per metre; the lode is 2 ft. wide, and yields 3 tons of ore per fathom. A few days before the close of the past month we had a change in the nature of this lode, being previously a red oxide of copper mixed with grey ores; the lode has narrowed considerably, but still we are in a good lode of black ore; sunk during the past month 1·71 metres. The 160, north of shaft, is set to two men, at $20 per metre; the lode is improving, yielding 1½ ton of ore per fathom; driven during the past month 3·80 metres. The 160 to drive south is set to three men, at $25 per metre; the lode during the past month was intersected by a small cross-course, which threw the lode a little to the left or east, but if anything the lode is better on the other side of this cross-course, being now 3½ ft. wide, and yielding 3 tons of ore per fathom; driven during the past month 3·60 metres. The winze to sink below this level, south of shaft, is set to three men, at $35 per metre; the lode is 4 ft. wide, and yields 4 tons of ore per fathom; sunk during the past month 1 metre. The 150 to drive north of shaft is set to two men, at $20 per metre; driven during the past month 3 metres; the lode is 2½ ft. wide, and yields 2½ tons of ore per fathom. In the 150 south one man still continues taking up the bottom of this level; I hope this will be completed in about a week more. I have also set a chiflon to sink below this level to one man, at $12 per metre, in a lode yielding 3 tons of ore per fathom. The winze below this level south has been put down to its required depth for communication with the 160. I had hoped that they would have holed by the end of the past month, but they have still about 1½ metre more to drive south at the 160 before the communication will be made. The 140 to drive north of shaft is set to one man, at $12 per metre; the lode has looked very promising here at times during the past month, but at present it is very poor; driven last month 5·82 metres. Two men are at present occupied in stoping down the back of the 60 south. There is one man engaged in driving the cross-cut to ventilate the engine-room. There are five men occupied on the top of the hill, making the excavation at surface. I hope this will be concluded in about a fortnight more, when we shall be able to commence sinking Holland's shaft. There are 21 men on tribute above the 180; we have 17 men stoping who are engaged in the backs of the 150 south, the 160 north and south, and the 170 north. The ores forwarded to Puquios during the month of August amount to 3200 kilos., or 320 tons of copper ores, with an estimated percentage of 22 per cent.

Checo Copper Mine.—No improvement has taken place here, which I feel to be rather discouraging after having successfully intersected the north lode. Our profit here for the six months ending June was over $2000. Rising above the 40, on south lode, by one man, at $22 per metre; the lode is 2 ft. wide, but at present poor. The 40 end, on north lode, by one man, at $10 per metre; the lode is 3½ ft. wide, but unproductive. The chiflon below this level, by two men, at $11 per metre; the lode here is quite 4 ft. wide, but very poor. I have every confidence that we must find something here. The 50 cross-cut, at Herman's, by one man, at $11 per metre; we are continually intersecting here small veins of quartz and layers of soft clay. We have seven men stoping. August production and estimated percentage 430 kilos, at 13 per cent.

Silver Mine.—The bottom level here, on south branch, has intersected the large lode that is traversing this sett at this point; it is about 3 ft. wide, and composed of leaders of quartz and sulphuret, but as yet containing very little silver; we are extracting a little silver ore from a branch that is diverging from this lode. The chiflon sinking below the bottom level, on north branch, by one man, at $12 per metre; this branch has become a little wider since my last report, but still without silver. Estimated value of Dulcinia August production, $27,650; expenditure, $1000; surplus, $17,650. Checo production, $1764; expenditure, $1100; surplus, $664: total, 18,314; less loss on Checo Silver Mine, $100: total profit for August, $18,214. This estimate, perhaps, will be subject to a slight modification, as our ores are not yet sold. The price now in England, according to last telegram, is 61l., against 61l. 10s. last month. I have, however, calculated on receiving a little lower price.

— The chief manager, Mr. Powditch, writes under date Sept. 11: Finance: The following shows what may be expected from August month provided the ores are sold at previous prices:—Ex Dulcinea, 3200 m.g., 22 per cent., at 7·80, $24,960; ex Checo, 450 m.g., 13 per cent., at 3·82, $1719; from other sources, $600; gross receipts, $27,279. Expenditure by estimation—Dulcinia August cost sheet, $9000; Checo, $1200; general charges, $1200—$11,400; surplus to remit, $15,879.

Remittances.—Enclosed is the second of exchange of A. Edwards and Co. on London, at $90 for 636l. 1s. 4d. Original already sent with direct course to yon from Valparaiso. A further amount of $5300 has gone south to purchase another remittance; if in time you will receive the setting of it by this post. By next mail all surplus from July sales will take a like direction, about $4000.

UNITED MEXICAN.—Despatch from Mr. Henry, dated Guanaxuato, Sept. 30; Mine of San Cayetano de la Ovejera: These different workings are very much in the same state as last reported, but in the end of La Purisima there is a little change seemingly for the better; the lode is more robust than it has been hitherto, and ore of a low ley is spread over the whole width of it. The strip in the alto of the vein, where we have found the best ore, is getting broader, so that we expect a larger extraction from this working than the one we had last week. The contracielo of San Ignacio has given out without leaving any sign of a probable improvement. The stopes in the frente and the east side of the contracielo, continues on pretty fair ore. At the San Matso de Alto, we are still very near the San Antonio lode; we have not yet fonnd any appearances of silver. The strip on which we opened this working has the same appearance as at the beginning, being a ramification of quartz, and probably we shall have to drive some distance, as in the Purisima, before we discover ore. The heat in the end of La Purisima is increasing daily; we have to put up the ventilation apparatus to extract the foul air until we can communicate this working direct with the shaft.

CANADIAN COPPER.—F. Bennetts, Oct. 22: Bolton Mine: The cross-cut through the vein in the 10, south of north shaft, still discloses a portion of the vein, composed of iron pyrites and copper ore; the thickness of the part of the vein so passed through is about 5 ft. to the present. The vein in the cross-cut is very hard, but on the hanging-wall surface indications show it to be of a softer nature. The portion now being passed through is what may be considered as the capel part of the vein.—St. Francis Mine: There having been no available boiler to be used for the pumping out of the mine we have engaged but a few men to properly secure the adit and shaft until such time as a suitable boiler could be obtained. This has now been procured, and the pumping out of the water from the shaft will commence as soon as it is placed in position.—Hartford Mine: This mine is gradually assuming such a state of order as to admit of the stoping being worked to the best advantage for the breaking of ores. We find that the vein in the stopes we have worked yields a large quantity of ore; that with such dressing as the picking out of the waste rock and such pieces of pure iron pyrites as present themselves will assay in mass from 3½ to 4 per cent. (wet assay) for copper. As these ores can be dressed up by a more careful selection to 5 or 5½ per cent. (wet assay), it is our intention to do so, making a parcel of the low grade fer kernel roasting or other treatment. We have a stope in the bottom of the 10, east of No. 7 shaft, that will yield ores as broken in mass from the vein, of from 6 to 7 per cent. for copper, and we trust to soon have this stope in proper order for attack. There is also a stope in the back of the 70 of good quality ore, but this will take some two months to lay open; and west of No. 5 shaft there is a stope at the 50 from which we have broken some good ores, and are waiting the completion of a truck to hoist. The position of the mine, therefore, now is that there are several stopes from which large quantities of ore can be, or soon can be, readily broken, and that whilst some of these stopes yield ores that with very little dressing will assay from 4 to 5 per cent. (dry assays), other stopes yield ores that require a more careful selection in order to bring them up to the standard of 4 to 5 per cent. dry, which I think is the most profitable point for delivery to the smelter, entailing the least waste of any copper ores that could be turned to account.—Acton Mine: The vein in the 30, east of No. 5 shaft, still continues very promising, yielding stones of yellow copper ore. A cross-head has been cut in this drift, and on breaking through it purple ore has been found, in addition to the rich yellow ores before mentioned.

BUENA VENTURA.—Oct. 27: The lode in the 50, driving west of Cox's engine-shaft, is easy for driving through, but it does not contain any ore. In the 40, driving in the same direction, the lode, worth 1 ton of ore per fathom, has fallen off a little in value during the past week. The lode in the 50, driving east of Cox's engine-shaft, is small, containing a little ore, but not enough to value. The 40, driving east of Cox's engine-shaft, consists of a large kindly lode, yielding stones of ore. The lode in the 20, driving east of Taylor's engine-shaft, is improving, and produces 1 ton per fathom. In the 20, driving west of Taylor's engine-shaft, the lode is small, but very compact and regular, worth 1 ton of ore per fathom. No. 3 winze, sinking below the 10, is going down in a moderately productive lode, valued at 1 ton per fathom.

ALAMILLOS.—Oct. 27: In the 130, driving east of Taylor's engine-shaft, only a part of the lode has been taken down, worth 2 tons of ore per fathom; we think it will be found more valuable when properly cut through. The western level will be driven also when the plunger-lift is fixed. In the 115, driving west of Taylor's engine-shaft, there is a large lode, but it does not contain any ore. The lode in the 85, driving west of San Adriano shaft, is small and poor. In the 60, driving east of San Victor shaft, the lode has improved, and is now producing good stones of lead, worth ¼ ton per fathom. The lode in the 70, driving in the same direction, and producing 4 tons of ore per fathom, has fallen off a little in value. In the 70, driving west of San Victor shaft, the lode is producing less lead than when last reported; its present value is ½ ton per fathom. In the 50, driving west of Judd's cross-cut, there is a small well-defined lode, worth ½ ton of ore per fathom. The lode in Manuel's winze is large and easy for sinking below the 60, being valued at ½ ton per fathom. In Sisto's winze, sinking below the 50, the lode has improved in value, and is opening good stoping ground at 1 ton per fathom.

LINARES.—Oct. 27: Pozo Ancho: The lode in the 130, driving east of Warne's engine-shaft, contains a little ore, but not sufficient to value. The 115, driving in the same direction, is opening up a fine run of ore ground at 3 tons per fathom. In the 130, driving west of Warne's engine-shaft, the lode is very wide, consisting of carbonate of lime, intermixed with granite. In the 135, driving west of Peill's engine-shaft, there is a large kindly lode, yielding fine lumps of ore, worth 1½ ton per fathom. The lode in the 120, driving west of Peill's engine-shaft, is compact and regular, and of a promising appearance, producing 1 ton of ore per fathom. In the 105, driving west of Peill's engine-shaft, the lode is small, consisting of quartz and lead ore, valued at ½ ton per fathom. The 135, driving east of Peill's engine-shaft, consists of a regular and well-defined lode, worth 1½ ton per fathom. The lode in the 120, driving east of Peill's engine-shaft, continues unproductive. No. 237 winze, sinking below the 120, is going down in a good shoot of ore, producing 2 tons per fathom.—Quinientos Mine: In the 100, driving east of Taylor's engine-shaft, the ground is hard, and the lode unproductive. The lode in the 90, driving east of Taylor's engine-shaft, worth 1 ton per fathom, has fallen off a little in value during the past fortnight. In the 80, driving east of western boundary, the lode is small and poor. The lode in the 55, driving east of western boundary, contains a few spots of ore, but nothing to value. The men are getting on well with Judd's shaft sinking below the 65.

FORTUNA.—Oct. 26: Canada Incoss: In the 120, driving west of O'Shea's engine-shaft, there is a promising lode, composed of spar and lead ore, producing ¾ ton per fathom. The lode in the 50, driving west of Abercrombie's shaft, is not so large; ground easier for driving. In the 60, driving west of Abercrombie's shaft, the lode is small at present. The lode in the 70, driving west of San Pedro's shaft, has fallen off in value of late. In the 80, driving in the same direction, the lode is disturbed by a cross joint. In the 90, driving west of San Pedro's shaft, there is a large lode, producing good lumps of lead ore, worth ¾ ton per fathom. The lode in the 90, driving east of San Pedro's shaft, has improved in appearance, but without ore to value. The lode in the 80, driving east of San Pedro's shaft, remains good, and produces 1 ton of ore per fathom. In the 70, driving east of San Pedro's shaft, the lode is without lead enough to value. The 120, driving east of O'Shea's engine-shaft, consists of a well-defined lode, producing 1 ton of ore per fathom. In the 100, driving east of Lownde's shaft, the lode is not looking quite so well as it was; its present value is ½ ton per fathom. In the 90, driving east of Caro's shaft, the lode, worth ½ ton per fathom, is split into branches, each containing a little ore. There is a little improvement in Arista's winze, sinking below the 30, and producing ¼ ton of ore per fathom. Lopez's winze, sinking below the 70, is going down in a good lode, worth 1 ton per fathom. Alfonso's winze, sinking below the 50, consists of a compact lode, valued at ¾ ton per fathom.

Los Salidos: In the 175, driving west of Taylor's engine-shaft, the lode is large, intermixed with spar and lead ore, worth ½ ton per fathom. The lode in the 160, driving west of Taylor's engine-shaft, is split into branches, and without any ore to value. In the 175, driving east of Taylor's engine-shaft, the lode maintains its size and value at 1 ton per fathom. The 160, driving in the same direction, has fallen off in value; lode small and irregular, producing ½ ton per fm. The 145, driving east of Taylor's engine-shaft, is without improvement. In the 130, driving east of Taylor's engine-shaft, there is a good and productive lode, opening up rich stoping ground, worth 2 tons per fathom. The lode in the 120, driving east of San Pablo's shaft, and producing 1½ ton per fathom, has been without variation during the past fortnight. In the 80, driving east of Palgrave's engine-shaft, we have intersected the Quinientos lode, and it produces good stones of lead, but not sufficient to value. Manrique's winze, sinking below the 160 (east), has further improved, and is going down in a good lode, worth 1½ ton per fathom. The lode in Galera's winze, sinking below the 160 (west), is small, and at present unproductive.—San Anton Mine: In the 45, driving east of Henty's engine-shaft, the lode is large, containing barytes and large lumps of lead ore, valued at 1 ton per fathom. The lode in the 30, driving in the same direction, is compact, but has slightly fallen off in value, its present worth being 1½ ton per fathom. In the 30, driving west of Henty's engine-shaft, nothing of any value has yet been met with. The lode in Henty's engine-shaft, sinking below the 45, is large and regular, producing 2 tons of ore per fathom; ground moderately easy for driving.

[For remainder of Foreign Mines se's to-day's Journal.



STEAM TRAMWAYS COMPANY OF IRELAND.—A petition has been presented to the High Court of Justice for the winding-up of the above-named undertaking.

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